The PHOTOFACT® Servicer

SET 546 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ SEPT. 1961

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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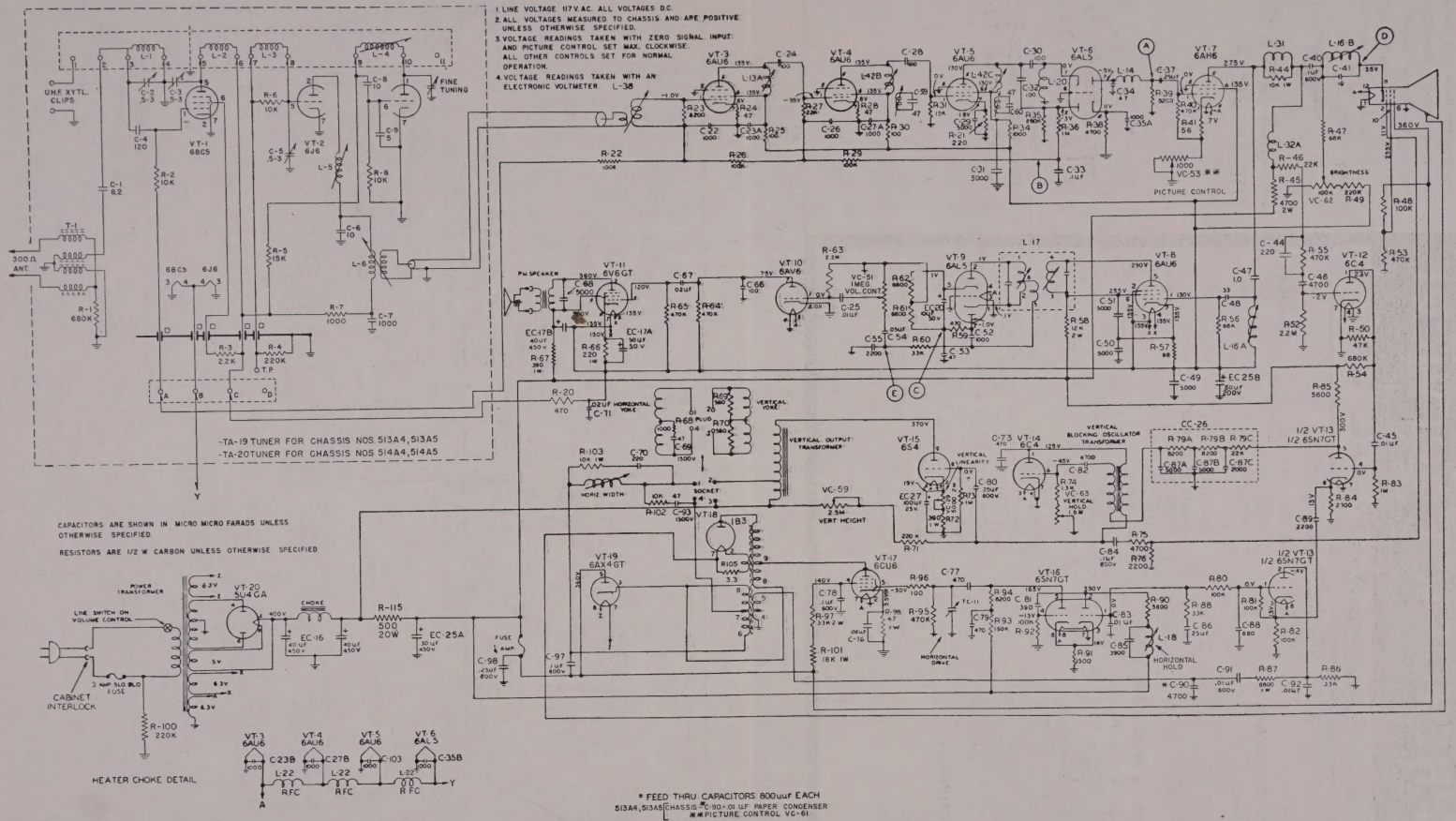
Emerson Models 858B, 875B (CH. 120365B)

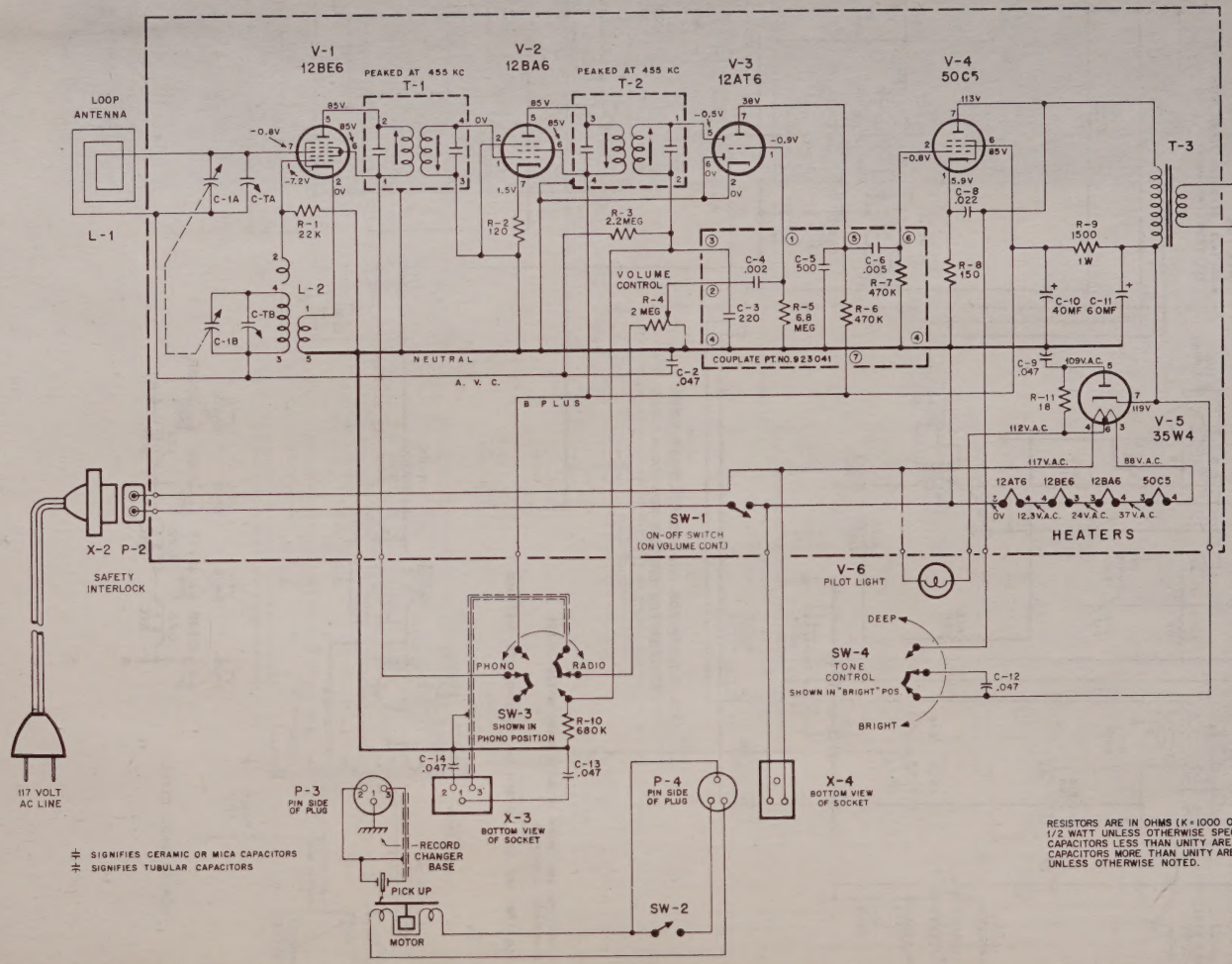
Trav-Ler Chassis 513A4, 513A5, 514A4, 514A5


1. LINE VOLTAGE 117 V.AC. ALL VOLTAGES D.C.
2. ALL VOLTAGES MEASURED TO CHASSIS AND ARE POSITIVE UNLESS OTHERWISE SPECIFIED.
3. VOLTAGE READINGS TAKEN WITH ZERO SIGNAL INPUT AND PICTURE CONTROL SET MAX. CLOCKWISE. ALL OTHER CONTROLS SET FOR NORMAL OPERATION.
4. VOLTAGE READINGS TAKEN WITH AN ELECTRONIC VOLTMETER.
-TA-19 TUNER FOR CHASSIS NOS 513A4,513A5
-TA-20TUNER FOR CHASSIS NOS 514A4,514A5
CAPACITORS ARE SHOWN IN MICRO MICRO FARADS UNLESS OTHERWISE SPECIFIED.
RESISTORS ARE 1/2 W CARBON UNLESS OTHERWISE SPECIFIED.
HEATER CHOKE DETAIL
* FEED THRU CAPACITORS 800uuf EACH
513A4,513A5 CHASSIS C-90 = .01 UF PAPER CONDENSER
** PICTURE CONTROL VC-61
PICTURE CONTROL
BRIGHTNESS
HORIZONTAL HOLD
VERTICAL HOLD
VERT. HEIGHT
HORIZ. WIDTH
VERTICAL LINEARITY
HORIZONTAL DRIVE
VERTICAL OUTPUT TRANSFORMER
VERTICAL BLOCKING OSCILLATOR TRANSFORMER
VOL. CONT.
FINE TUNING
CABINET INTERLOCK
LINE SWITCH ON VOLUME CONTROL
POWER TRANSFORMER
CHOKE
FUSE
VERTICAL YOKE
HORIZONTAL YOKE
PM SPEAKER
300 Ω ANT.

TRAV-LER CHASSIS 513A4, 513A5, 514A4, 514A5

Schematic Diagram Courtesy of Trav-Ler Radio Corporation

EMERSON MODELS 858B, 875B (CH. 120365B)



Schematic Diagram Courtesy of Emerson Radio & Phonograph Corporation

PHOTOFACT® Folder with CIRCUITRACE®

PACKARD-BELL CHASSIS 98C3, 98C4, 8TU5, DPA-20, RM-301, -400, -401

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

PACKARD-BELL CHASSIS 98C3, 98C4, 8TU5, DPA-20, RM-301, -400, -401

PACKARD-BELL CHASSIS 98C3, 98C4, 8TU5, DPA-20, RM-301, -400, -401

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PACKARD-BELL CHASSIS 98C3, 98C4, 8TU5, DPA-20, RM-301, -400, -401

PACKARD-BELL CHASSIS 98C3, 98C4, 8TU5, DPA-20, RM-301, -400, -401

MODEL 21CK1

TRADE NAME	PACKARD-BELL MODEL	TV Chassis	Remote Control	FM-AM Tuner	Stereo Amp.	VHF Tuner
	21CC3	98C3 ...	RM-301			10651B
	21CC3A ...	98C3 ...	RM-400			10651B
	21CK1	98C4 ...	RM-401 ...	8TU5 *	DPA-20	10651B

*Some Versions with Remote Balance Control Chassis RMS-2

MANUFACTURER	Packard-Bell Electronics Corp., Service Div., 1920 S0. Figueroa St., Los Angeles 7, Calif.
TYPE SET	Color Television Receiver
TUBES	TV: Twenty-Seven FM-AM Tuner: Eight Stereo Amp.: Seven
POWER SUPPLY	110-120 Volts AC, 60 Cycle
RATING	460 Watts, 4.4 Amp. @ 117 Volts AC (490 Watts While Tuning) TV: 320 Watts, 3.1 Amp. @ 117 Volts AC (Less Amp.) FM-AM Tuner with Amp.: 140 Watts, 1.3 Amp. @ 117 Volts AC (Selector Switch in FM, AM, or Phono Position, Less Motor)
TUNING RANGE	TV: Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) FM-AM Tuner: BC-540 to 1600KC (455KC IF) FM-88 to 108MC (10.7MC IF)

FOR SERVICE ON RECORD CHANGER (PACKARD-BELL PT. #58093) - SEE SIMILAR GLASER-STEERS MODEL GS-77 REVISED- PHOTOFACT SET 482 FOLDER 11

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TV CHASSIS 98C3, 98C4	2
REMOTE CONTROL RM-400, RM-401	10
REMOTE CONTROL RM-301, ALTERNATE CIRCUITS	11
VHF TUNER 10651B	27
FM-AM TUNER 8TU5, REMOTE CONTROL BALANCE CHASSIS RMS-2	28, 33
AMP CHASSIS DPA-20	30

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BLOCK DIAGRAM - BACK PAGE

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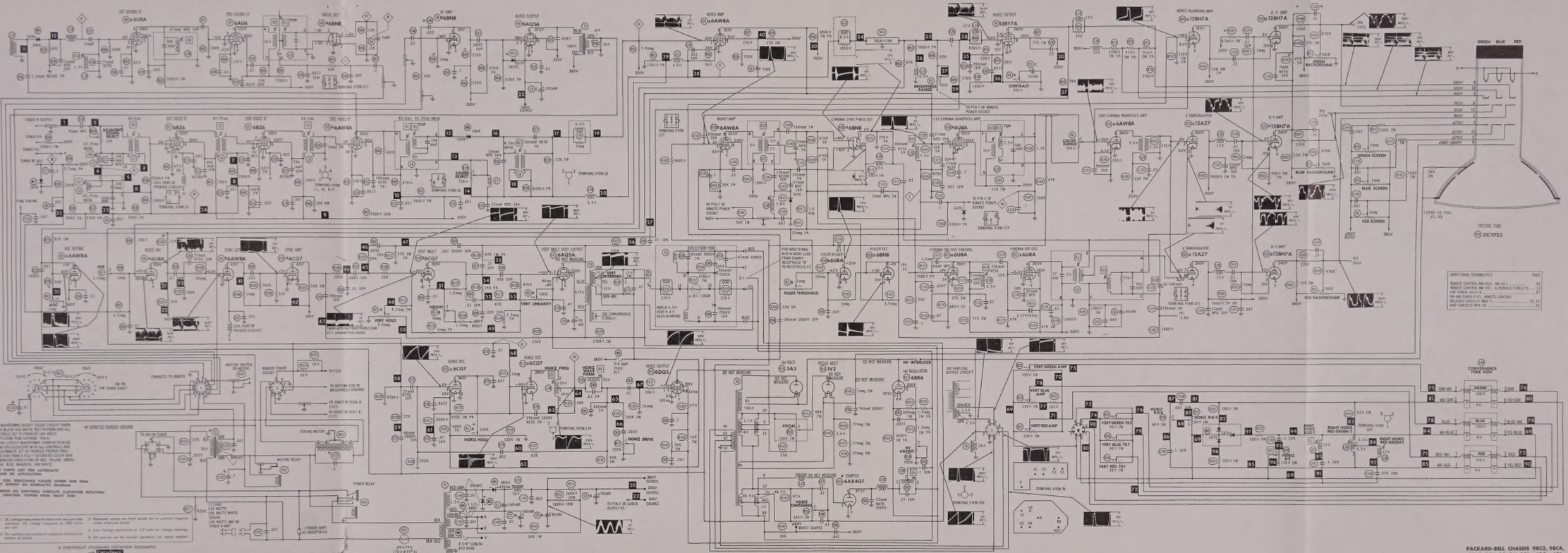
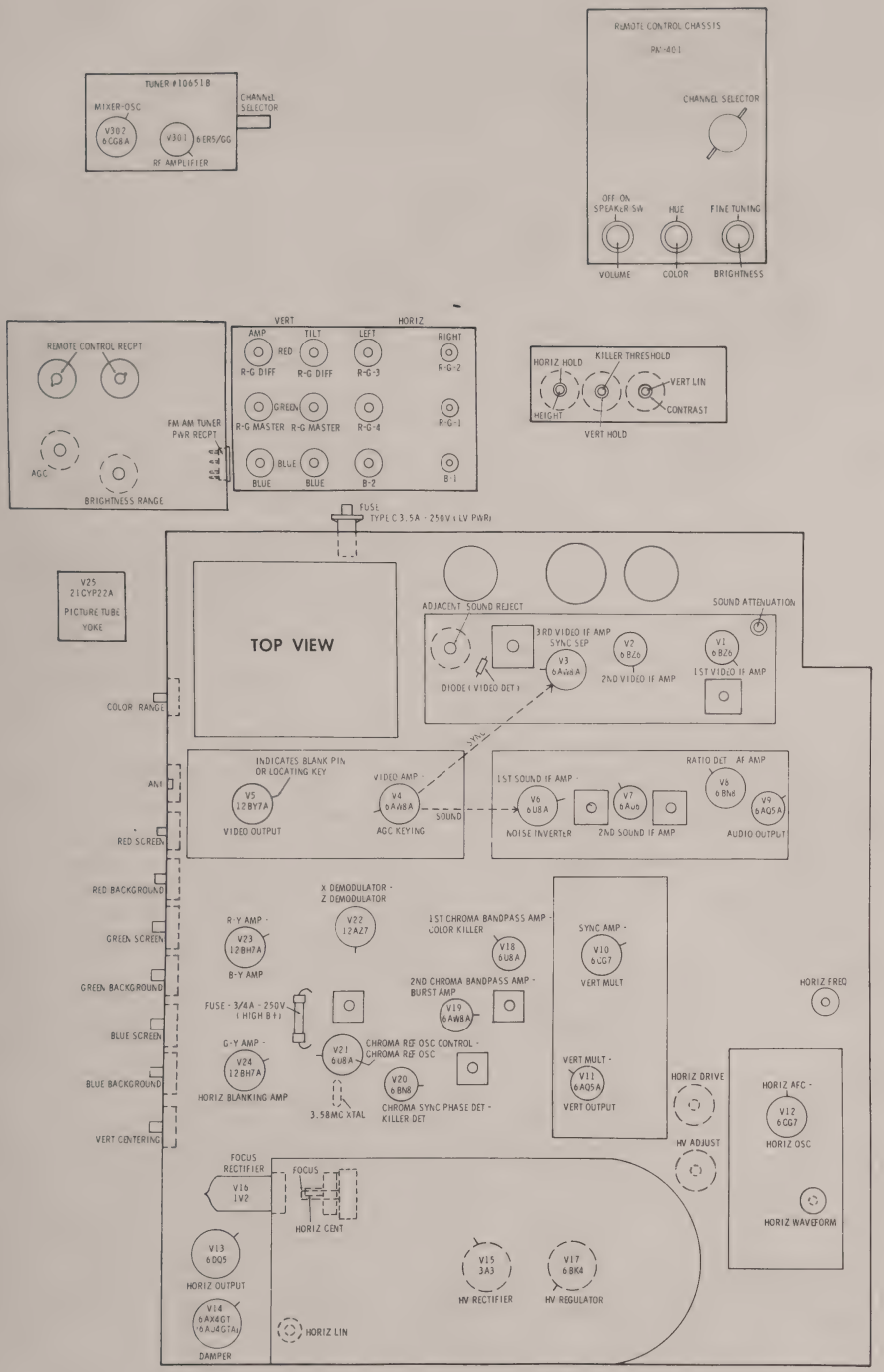
KB838


1ST SOUND IF
2ND SOUND IF
RATIO DET
RF AMP
AUDIO OUTPUT
VIDEO AMP
VIDEO OUTPUT
HORIZ BLANKING AMP
R-Y AMP
G-Y AMP
B-Y AMP
TUNER IF
1ST VIDEO IF
2ND VIDEO IF
3RD VIDEO IF
BURST AMP
CHROMA SYNC PHASE DET
1ST CHROMA BANDPASS AMP
2ND CHROMA BANDPASS AMP
2 DEMODULATOR
AGC KEYING
NOISE INV
SYNC AMP
VERT MULT
VERT MULT VERT OUTPUT
VERT LINEARITY
VERT HOLD
HORIZ AFC
HORIZ OSC
HORIZ FREQ
HORIZ OUTPUT
HORIZ DRIVE
HORIZ HOLD
HV RECT
HV REGULATOR
HV INTERLOCK
FOCUS
HV ADJUST
BOOST SOURCE
KILLER DET
KILLER THRESHOLD
CHROMA REF OSC CONTROL
CHROMA REF OSC
COLOR KILLER
COLOR RANGE
BRIGHTNESS RANGE
CONTRAST
GREEN BACKGROUND
BLUE BACKGROUND
RED BACKGROUND
GREEN SCREEN
BLUE SCREEN
RED SCREEN
PICTURE TUBE
21CYP22
CONVERGENCE YOKE ASSY
VERT GREEN AMP
VERT BLUE AMP
VERT RED AMP
VERT BLUE TILT
VERT RED TILT
RIGHT HORIZ RED GREEN-1
RIGHT HORIZ BLUE
RIGHT HORIZ RED GREEN-2
HORIZ BIAS
TUNING MOTOR
MUTING RELAY
POWER RELAY
REMOTE CHASSIS GROUND
ADDITIONAL SCHEMATICS
PACKARD-BELL CHASSIS 98C3, 98C4, BTU5, DPA-20, RM-301, -400, -401

TV TUBE PLACEMENT CHART



PACKARD-BELL CHASSIS 98C3, 98C4, 8TU5, DPA-20, RM-301, -400, -401

FOLDER 1

TV ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A1 thru A19 ..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A20 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

VIDEO IF ALIGNMENT

Connect the negative lead of a 9 volt bias supply to point Ⓐ. Positive to chassis.
Connect the negative lead of a 3 volt bias supply to point Ⓑ. Positive to chassis.
Connect the negative lead of a 7 volt bias supply to point Ⓒ. Positive to chassis.
Connect negative lead of a 7 volt bias supply to pin 2 of V24. Positive to chassis.
Connect a clip lead from point Ⓔ to chassis. Preset Sound Reject (R19) at 75% clockwise rotation. Preset Adjacent Sound Reject (R20) at 50% rotation. Video IF shield must be in place during alignment.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V302). Low side to chassis.	43.8MC (Unmod.)	4	DC probe thru 10K to point Ⓓ. Common to chassis. Use negative scale.	A1	Adjust for maximum deflection. Use peak with core nearest printed board end of coil. Maintain VTVM reading of 1.5 volts by adjusting signal generator output.
2.	"	"	42.5MC	"	"	A2	"
3.	"	"	45.75MC	"	"	A3	"
4.	"	"	44.0MC	"	"	A4	"
5.	"	"	"	"	"	Mixer Plate Coil	Adjust for maximum deflection with peak at top end of coil.
6.	"	"	41.25MC	"	"	A5, R19	Adjust A5 and Sound Reject (R19) simultaneously for MINIMUM deflection with slug away from chassis. Reduce bias at point Ⓐ if necessary for sufficient indication.
7.	"	"	47.25MC	"	"	A6, R20	Adjust A6 and Adjacent Sound Reject (R20) simultaneously for MINIMUM deflection with slug away from chassis.
8.	"	"	41.25MC	"	DC probe thru 10K to point Ⓕ. Common to chassis.	A7	Increase bias at point Ⓐ to -6 volts. Adjust A7 for MINIMUM deflection with slug away from chassis.

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Connect a .001mfd capacitor in series with a 180Ω resistor from pin 5 (plate) of 6BZ6 (V2) to chassis with the resistor next to chassis.
Connect a 1000mmf capacitor across the scope leads.
The Video IF shield must be in place during alignment.
Connect the DC probe of the VTVM to point Ⓑ. Common to chassis. (Use negative scale.)
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V302). Low side to chassis.	45MC	42.17MC 45.75MC	4	Vert. Amp. thru demodulator probe (Fig. 1) to pin 5 (plate) of 6BZ6 (V1). Low side to chassis.		Set sweep output for .1 volt peak to peak on scope. Retouch Mixer Plate Coil and A4 for maximum gain and symmetry of response similar to Fig. 2. Reduce bias to -4 volts at point Ⓐ if necessary.
								[redacted] at point Ⓐ to zero. Retouch marker in trap notch as in Fig. 2.
								and R20 to place marker in trap Fig. 2. Remove capacitor and d from 6BZ6 (V2). Increase t A to -6 volts. Remove d 180Ω from pin 5 of V2.
				42.75MC 45.0MC 45.75MC		side to chassis.		peak to peak on scope. Retouch A3 for response similar to Fig. 3 with markers as shown. A1 controls tilt, A2 affects 42.17MC side of curve and A3 affects 45.75MC side. Connect a .001 mfd capacitor from point Ⓖ to chassis.
13.	"	"	"	41.25MC	"	"		Retouch A5 and R19 to place 41.25MC in trap notch if necessary. Remove .001 mfd.
14.	Fig. 4	Across VHF antenna terminals thru matching network (Fig. 4).	All VHF channels separately	42.17MC 45.0MC 45.75MC	All VHF channels separately	"		Decrease bias at point Ⓑ to -3 volts. SLIGHTLY retouch A1, A2 and A3 to correct for any overall tilt that is approximately the same on all channels. Repeat step 13.

TV ALIGNMENT INSTRUCTIONS

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
15.	.01mfd	High side to pin 7 (grid) of 3rd Video IF Amp. Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe to point Ⓗ. Common to chassis.	A8, A9, A10	Adjust for maximum deflection.
16.	"	"	"	"	DC probe to point Ⓖ. Common to point Ⓚ.	All	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
17.	.01mfd	High side to pin 7 (grid) of 3rd Video IF Amp. Low side to chassis.	4.5MC (400∿ 30% AM)	Any non-interfering channel	DC probe thru detector probe to pin 6 (plate) of 1st Chroma Bandpass Amp. Common to chassis.	A12	Adjust for MINIMUM deflection.

CHROMA BANDPASS ALIGNMENT

Connect the negative lead of a 7 volt bias supply to point Ⓛ. Positive to chassis.
Connect a clip lead from point Ⓔ to chassis.
Turn Color Range fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	.1mfd	High side to pin 2 (grid) of 6U8 (V18). Low side to chassis.	3.58MC (3.5MC Sweep)	3.08MC 4.08MC	Any non-interfering channel	Vert. Amp. thru demodulator probe (Fig. 5) to pin 2 (grid) of 12AZ7 (V22). Low side to chassis.	A13, A14	Adjust for response similar to Fig. 6 with equal marker height.
19.	Turn the Brightness Range, Contrast, and A.N.I. controls fully counterclockwise. Connect 330Ω resistor and 4mfd capacitor in series from plate (pin 6) of 6U8 (V18) to chassis.							
20.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. Tube (V302). Low side to chassis. Connect high side of separate marker generator to ungrounded tube shield of 1st Chroma Bandpass Amp. (V18). Low side to chassis.	45MC (10MC Sweep)	3.08MC 4.08MC	Any non-interfering channel	Vert. Amp. thru demodulator probe (Fig. 6) to pin 2 (grid) of 12AZ7 (V22). Low side to chassis.	A15	Remove clip lead between point Ⓔ and chassis. Adjust A15 for response similar to Fig. 7. Peak with core nearest chassis end of coil form.

FIG. 1

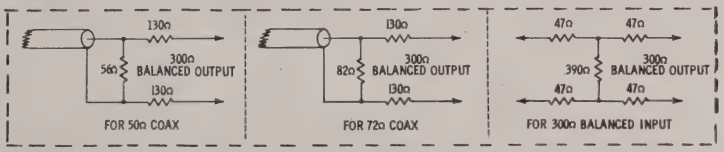


FIG. 4

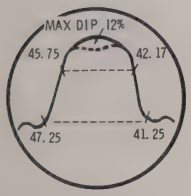


FIG. 2

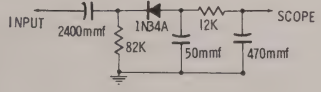


FIG. 5

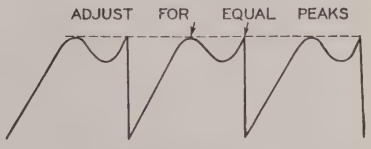


FIG. 8

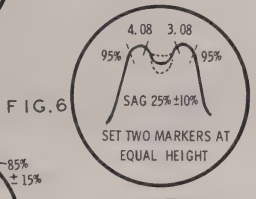


FIG. 6

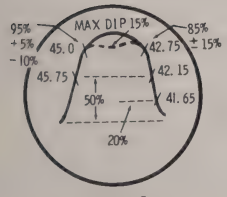


FIG. 3

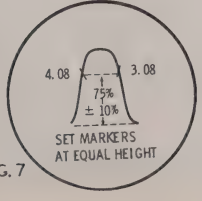


FIG. 7

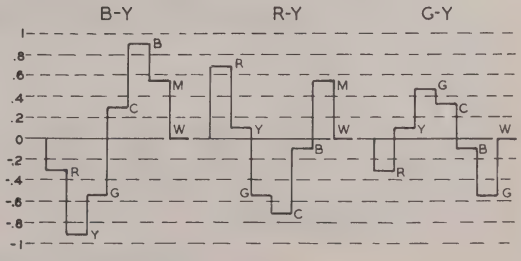
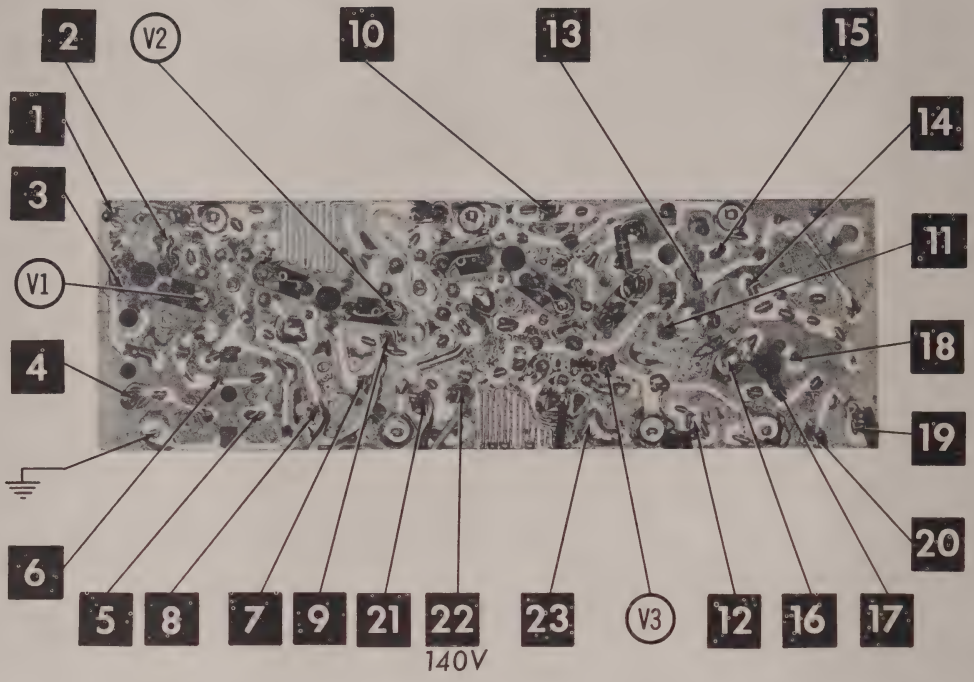


FIG. 9



A Howard W. Sams CIRCUITRACE* Photo

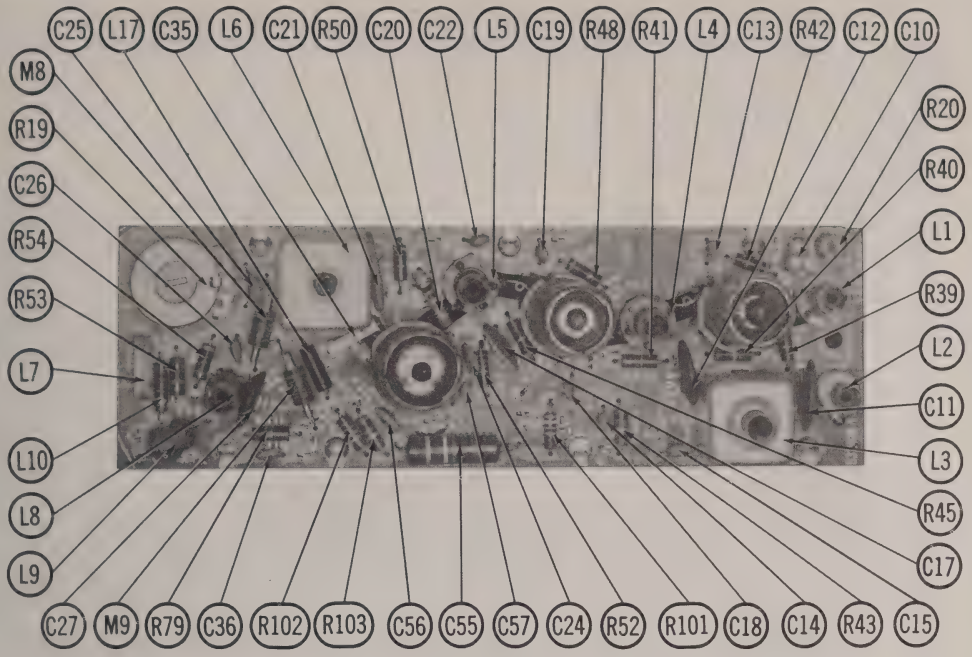
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VIDEO IF PRINTED BOARD

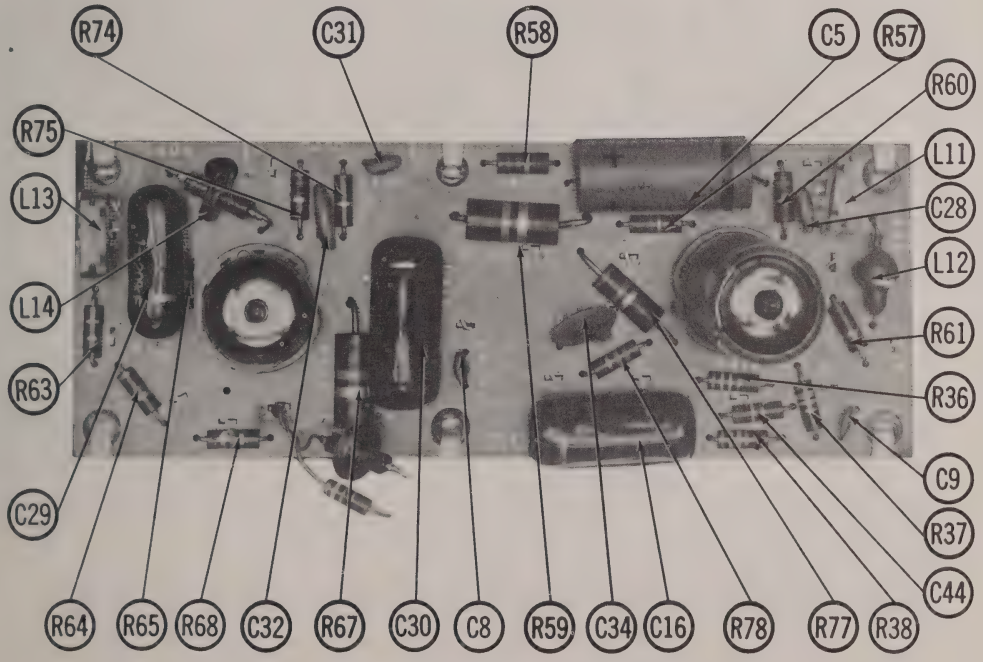
A Howard W. Sams CIRCUITRACE* Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

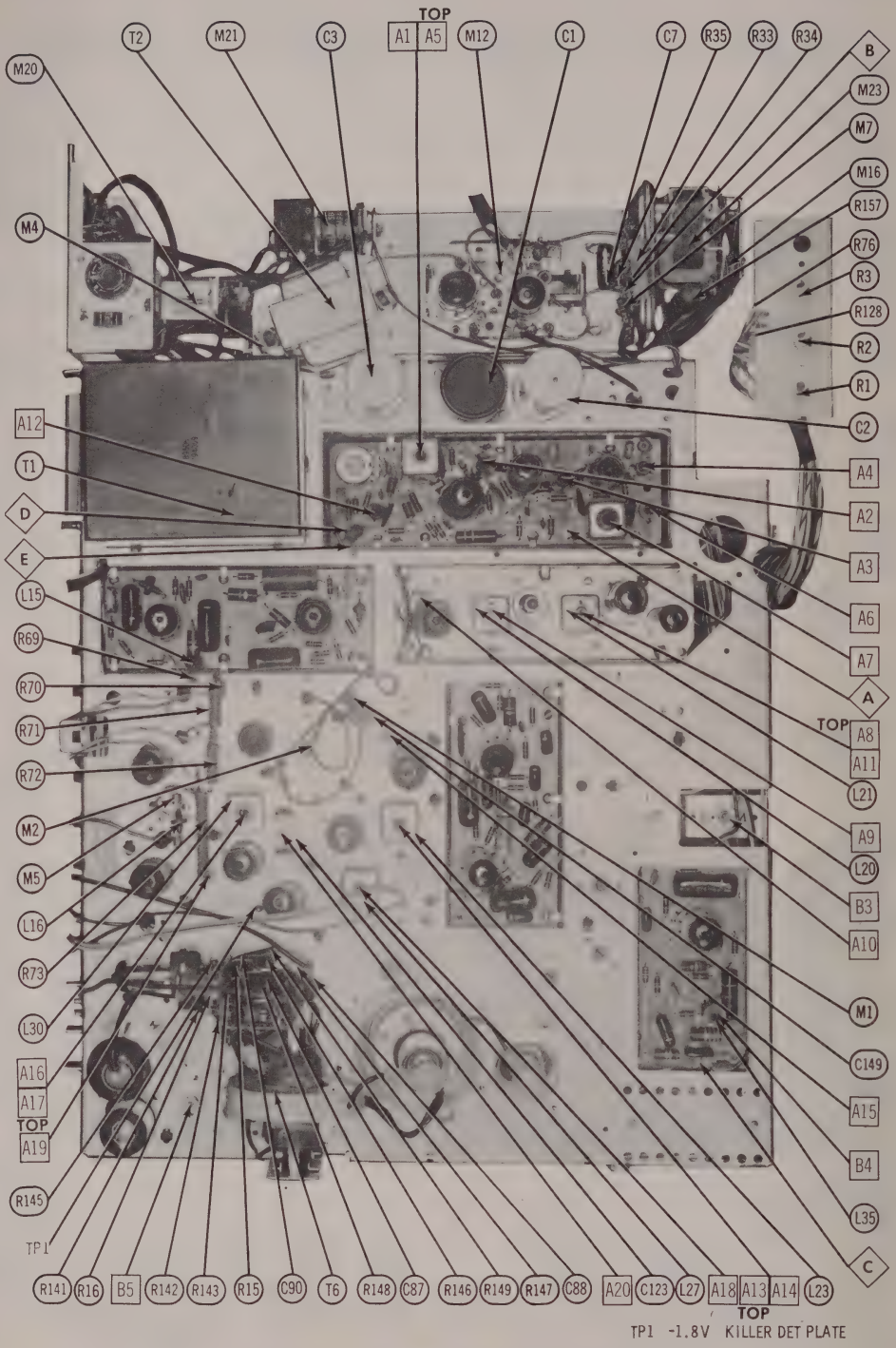
VIDEO, AGC PRINTED BOARD



VIDEO IF PRINTED BOARD



VIDEO, AGC PRINTED BOARD



TP1 -1.8V KILLER DET PLATE

TV CHASSIS - TOP VIEW

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA IHC PART No.	WORKMAN TV PART No.	REMARKS
R105	560K			
R106	33K			
R107	10K 2W			
R108	100K			
R109	10K			
R110	33K			
R111	22K 2W 5%			
R113	1meg 5%			
R113	8.2meg 5%			
R114	33meg 5%			
R115	1.5meg			
R118	1.5meg			
R117	47K			
R118	15K 5%			
R119	47K 1W 5%			
R120	470K			
R121	100K			
R122	330K			
R123	270SG 7W	PW7-270Ω	TW-5Ω-270Ω	
R124	82000			
R125	22K			
R126	330K			
R127	82K			
R128	120K 1W			
R129	680K 5%			
R130	270K 1W 5%			
R131	82000			
R133	1meg			
R133	68K			Note 1
R134	33K 2W			
R135	100K 1W			
R136	10meg			
R137	100Ω			Note 1
R138	47Ω			
R139	1K 7W	PW7-1K	TG-1K	
R140	56K 5W			
R141	68K 2W			
R142	27K			
R143	47Ω			
R144	10K			
R145	1.5Ω			
R146	22meg 5W			
R147	33meg 5W			
R148	22meg 5W			
R149	1meg 5W			
R150	1.5meg 1W 5%			
R151	1.5meg 1W 5%			
R152	100meg 1W (Special)			
R153	1000Ω 10%			
R154	4700Ω 2W			
R155	270Ω			
R156	270Ω			Note 3
R157	4.9Ω (C24)			
R158	33K 5%			
R159	10meg			
R160	1meg			#73755
R161	2.2meg			
R162	3600Ω			
R163	100Ω			
R164	10K 5%			
R165	33meg 5%			
R166	56K 1W *			

Note 1. May not be used in early versions.
Note 2. Chassis 88C3 uses 4.7meg.
Note 3. Not used in Chassis 88C3.

ITEM No.	RATING	REPLACEMENT DATA IHC PART No.	WORKMAN TV PART No.	REMARKS
R167	1.5meg			
R168	470K 5% †			† Matched Pair
R169	470K 5% †			
R170	270Ω 5%			
R171	270Ω 5%			
R172	33K			
R173	1600Ω 5%			
R174	27K 2W			
R175	18K 2W			
R176	680Ω 5%			
R177	47K			
R178	1000Ω			
R179	47K 1W			
R180	15000 1W			
R181	1800Ω			
R182	1800Ω 5%			
R183	470K			
R184	10K 5%			
R185	12K 2W			
R186	1500Ω			
R187	100K			
R188	47K			
R189	22K 2W			
R190	330Ω			
R191	150Ω			
R192	120K 1W 5%			
R193	39K 4W 5%	PW4-39K	4W-8Q-39K	
R194	1meg			
R195	47000 1W			Note 1
R196	120K			
R197	470K			
R198	15K 2W			
R199	47K 5%			Note 1
R200	56000 1W 5%			
R201	1meg			
R202	560Ω 1W 5%			
R203	18K 5W	PW3-15K	3W-8Q-15K	
R204	120K			
R205	470K			
R206	56000 1W 5%			
R207	1meg			
R208	15K 2W	PW3-15K	3W-8Q-15K	
R209	120K			
R210	470K			
R211	100K 2W			
R212	100K 5W			
R213	100K 2W			
R214	16000 10W	PW10-1600	10W-8Q-1600	
R215	16000 10W	PW10-1600	10W-8Q-1600	
R216	10K 1W			
R217	820K			
R218	22K			
R219	10Ω			
R220	10Ω			
R221	4MΩ-70Ω (70Ω @ 25°C)			
R222	100Ω			
R223	800Ω 1W			
R224	100Ω 1W			
R225	1000 1W			
R226	82Ω 1W			

Note 4. Chassis 88C3 uses 330K.
Note 5. 100K used in early versions.
Packard-Bell Part Number

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Packard-Bell PART No.	Mar9 PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	1st Video IF	39727					
L2	47.25MC Trap	39732					
L3	41.25MC Trap	39733					
L4	2nd Video IF	39728					
L5	3rd Video IF	39729					
L6A	4th Video IF	39730					
B	4.5MC Trap		BC-566	4632	RTC-4523	T986	
L7	RF Choke (Link)	39726					
L8	4.5MC Trap	39734	TV-496 †	6130 †	RTC-4573 †	T393 †	(1) Wound on 1meg Resistor.
L9	Peaking (82uh)	39650 (1)	BC-648	4604	RTC-4518	T990	† Parallel with 1meg Resistor.
L10	RF Choke (L.Sch)	39736	BC-646	4631	RTC-4527	T980	
L11	Peaking (180uh)	39731	TV-184 ▲	6130 ▲	RTC-4497 ▲	T350 ▲	(2) Wound on 1500Ω Resistor.
L12	Peaking (180uh)	39731 (2)	TV-184	6130	RTC-4527	T350	▲ Parallel with 1800Ω Resistor.
L13	Peaking (330uh)	39732	TV-185	6131	RTC-4590	T315	
L14	Peaking (390uh)	39659	TV-186	6131	RTC-4586	T315	
L15	Peaking (560uh)	39659	TV-186	6131	RTC-4586	T315	
L16	Peaking (680uh)	39660	BC-646	4632	RTC-4523	T986	
L17	RF Choke (Link)	39646	BC-566	4632	RTC-4523	T986	
L18	RF Choke (Link)	39646	BC-566	4632	RTC-4523	T986	
L19	1st Sound IF	39716 (3)	TV-128	1469	RTC-4602	T249	(3) Includes C36.
L20	2nd Sound IF	39718A	TV-129	1469	RTC-4603	T247	
L21	Ratio Detector	39696	TV-133	1464 RD	RTC-4608	T387	
L22	Chroma Takeoff	39744					
L23	1st Bandpass	39745					
L24	2nd Bandpass	39743					
L25	Peaking (830uh)	39669	TV-205	6146	RTC-4553	T238	
L26	Peaking (830uh)	39669	TV-206	6146	RTC-4553	T238	
L27	Burst Amp.	39748				T241	
L28	Bias Control	39648A					
L29	RF Choke (Link)	39743	BC-566	4632	RTC-4523	T986	
L30	Resistance Plate	39748				T185	
L31	Chroma Ref. Osc.	39747					
L32	RF Choke (Link)	39646	BC-566	4632	RTC-4523	T986	
L33	RF Choke (Link)	39646	BC-566	4632	RTC-4523	T986	

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA Packard-Bell PART No.	Mar9 PART No.	Miller PART No.	Stancor PART No.	Thordarson PART No.	Tried PART No.	Workman TV PART No.	NOTES
L34	Horiz. Osc.	39741				RH-7			
L35	Horiz. Waveform	39661							
L36	Horiz. Linearity	39740							
L37	Right Horiz., Blue #1	39734							
L38	Right Horiz., Red-Green #1	39734							
L39	Right Horiz., Red-Green #2	39735							
L40	Coax Yoke A-Green Coil								
	B-Blue Coil								
	C-Red Coil								

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ~'s	REPLACEMENT DATA Packard-Bell PART No.	Mar9 PART No.	Stancor PART No.	Thordarson PART No.	Tried PART No.	NOTES
L41	.430A	30Ω	.86 Hy.	89810		C-402X			

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC 1	SEC 2	REPLACEMENT DATA Packard-Bell PART No.	Mar9 PART No.	Stancor PART No.	Thordarson PART No.	Tried PART No.	NOTES
T1	117V	150V @ 2.7A	6.3V @ 1.8A AC	89606					
	SEC 3	SEC 4	SEC 5						
	6.3V @ 1.2A								

TRANSFORMER (MOTOR)

ITEM No.	RATING PRI.	SEC 1	SEC 2	REPLACEMENT DATA Packard-Bell PART No.	Mar9 PART No.	Stancor PART No.	Thordarson PART No.	Tried PART No.	NOTES
T2	117V	24V @ 1.8A		89608B (1)					(1) Alternate Part #89608A

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA Packard-Bell PART No.	Mar9 PART No.	Stancor PART No.	Thordarson PART No.	Tried PART No.	NOTES
T3	Vert. Output	89598					
T4	Vert. Conv. Choke	89599					
T5	Yoke (Horiz. 15MH) (Vert. 30MH)	39737					
T6	Horiz. Output	89607					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA Packard-Bell PART No.	Mar9 PART No.	Stancor PART No.	Thordarson PART No.	Tried PART No.	NOTES
T7	7500Ω	3-4Ω	89468	A-3036	A-3078 (1)	26B48	8-82	(1) Drill new mounting hole(s).

POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA Packard-Bell PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.43A	73058 (2)	1N1764 (4)	F5 (5)	SR300-5 (6)	(4) Silicon Type
M2	.43A	73058 (3)	1N1764 (4)	F5 (5)	SR300 (6)	(5) Selenium Type
M3,4		73060 (3)				(6) Sylvania Type
B						
C						

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Packard-Bell PART No. FUSE	HOLDER	LITTELFUSE PART No. FUSE	HOLDER	BUSS PART No. FUSE	HOLDER
M4	C	3A 250V	45047		3AG 3/4A 250V P/T	348007	C 3½	HC 3½ or 3½
M5	3AG	3/4A 250V P/T	45048		3AG 3/4A 250V P/T		GLV 3/4	
M6		3 3/4" long of #22 wire						

SIGNAL DIODES

ITEM No.	OEMC TYPE	REPLACEMENT DATA Packard-Bell PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M7	1N54	T2063		1N54	1N54	RF AGC Diode
M8	1N54	T2057		1N54	1N54	Video Detector, Digital
M9	1N54	T2057		1N54	1N54	Sound Detector, Digital
M10	1N295	T2060 (1)		1N295	1N295	Audio Sine Clamper
M11		37063				Burst Limiter
						(1) Not used in Chassis 88C3.

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M12	Tuner	10551B	
M13	Crystal	72089	3.58MC
M14	Delay Line	39748	
M15	Switch	88077	Motor, Channel Selector
M16	Switch		Muting
M17	Magnet	88006	Lateral Assembly
M18	Magnet	88007	Purity Ring
M19	Magnet		Convergence (3 used)
	Printed Board	10686	Video IF
	Printed Board	10688	Vertical
	Printed Board	10689	Sync
	Printed Board	10691	Convergence
M20	Relay	T2035A	Power (Ch. 88C4)
	Relay	T2039	Power (Ch. 88C3)
M21	Relay	T2064	Muting
	Switch	88718	Slide, Phono, Used in Chassis 88C3
M22	Motor	88087	Power Tuning

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

DESCRIPTION	PART NO.	MODEL NO. 21CC3	21CC3A	21CK1
Safety Glass	55142	X	X	X
Mask	55141	X	X	X
Dial Pointer-Radio	67049B			X
Lens, Knob-Radio	55115			X
Knob-Tuning-Radio-Top-Tuning	52306			X
Knob-Function-Dimension-Radio-Bottom-Tuning	52284			X
Knob-Volume-Bass, Treble, Loudness	52308			X
Knob-Radio-Bottom, Bass, Treble, Loudness	52278			X
Knob-VHF Channel Selector	52217H	X		
Knob-"	52339		X	X
Knob-Fine Tuning	52237B	X		
Knob-Fine Tuning-	52331		X	X
Knob-Volume-TV	52235C	X		

DESCRIPTION	PART NO.	MODEL NO. 21CC3	21CC3A	21CK1
Knob-Volume-TV-Inside Dual	52332		X	X
Knob-Brightness, Color Saturation	52236B	X		
Knob-Brightness, Inside Dual Color Saturation	52232		X	X
Knob-Hue	52237-1B	X		
Knob-Hue-Outside Dual	52331-1		X	X
Knob-Speaker, On-Off, Outside Dual	52331		X	X
Knob-Focus	52193	X	X	X
Knob-Contrast	52328			X
Knob-Horiz. Hold, Vert. Hold, Contrast, Tone	52328	X	X	
Cabinet-Remote Control	21135-2J	X		
Cabinet-Remote Control-Top	21184-1C		X	X
Cabinet-Remote Control-Bottom	21185A		X	X

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8886 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8235
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8484 (Tan) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 8 Conductor

REMOTE CONTROL RM-401
PARTS LIST AND DESCRIPTIONS

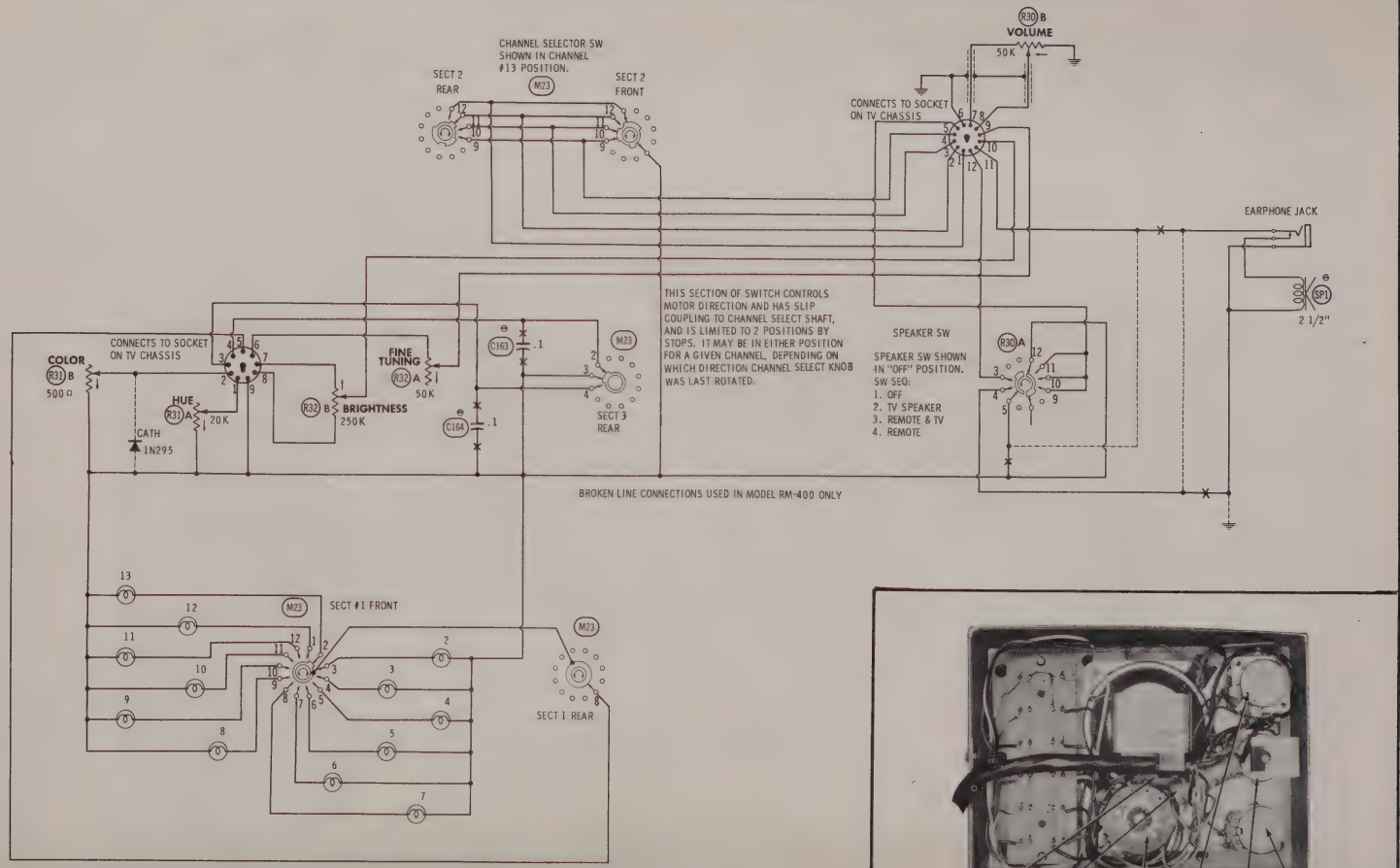
FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	FILMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C163	.1 200V		P2SBN-1	DF-104	P4K2P1	82P-3-104	GDYM-301	2TM-P10
C164	.1 200V		P2SBN-1	DF-104	P4K2P1	82P-3-104	GDYM-301	2TM-P10

CONTROLS

ITEM No.	RATING RESISTANCE	WATTS	REPLACEMENT DATA Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R30A	Switch		39049					Speaker Selector, Off-On
B	50K							Volume
R31A	20K		39633				■ (1) RM431	Mix
B	500Ω							Color
R32A	50K		39633					Fine Tuning
B	250K							Brightness

■ "STA-LOC" Equivalent: FA34R, RU32L, OS63T, 1SL187.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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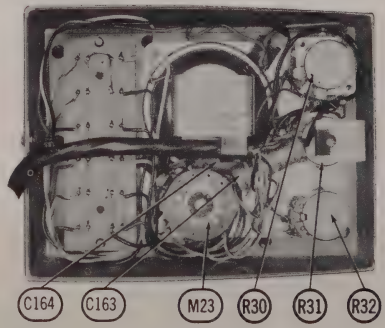
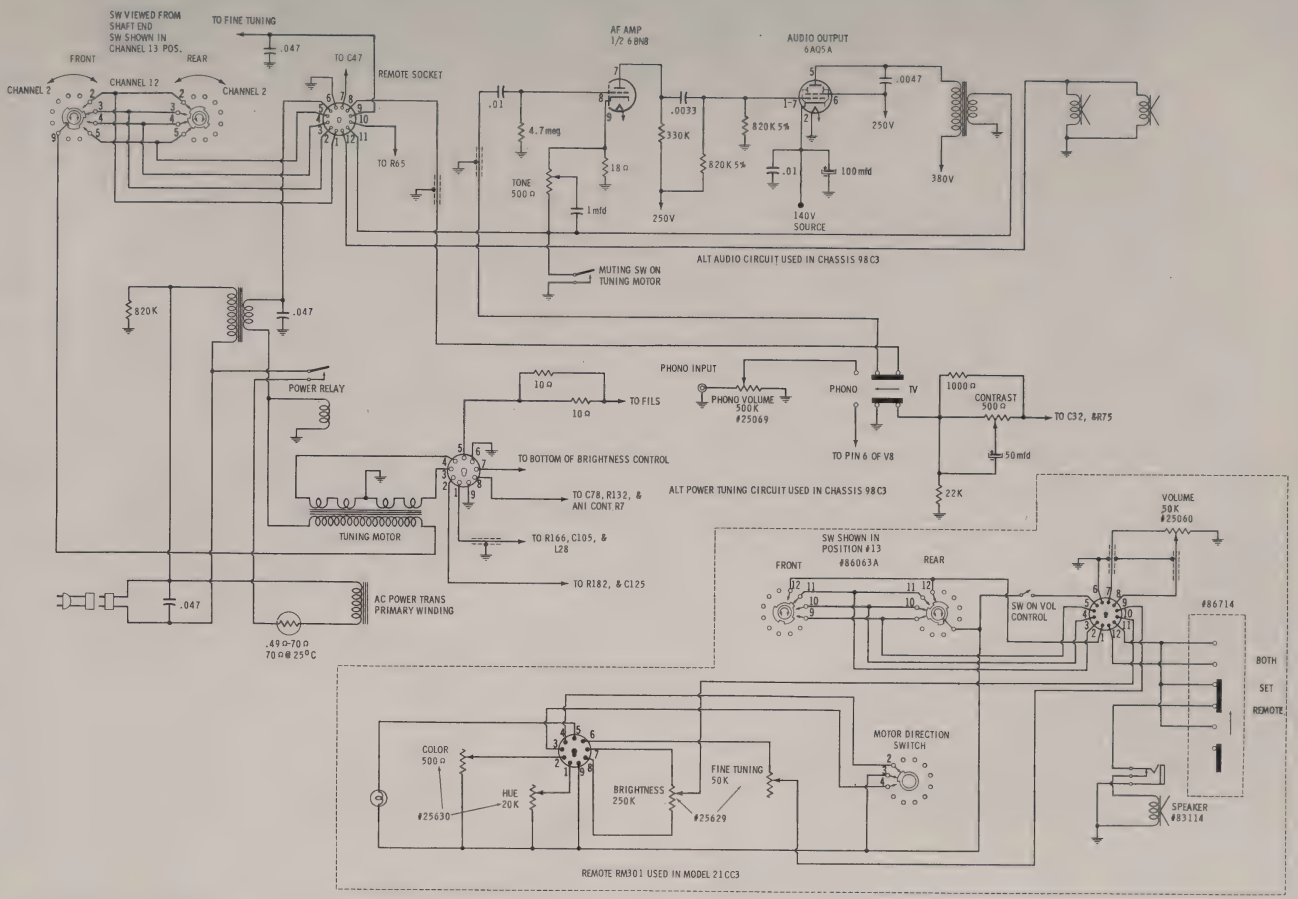


RM-401

REMOTE CONTROL RM-400, RM-401



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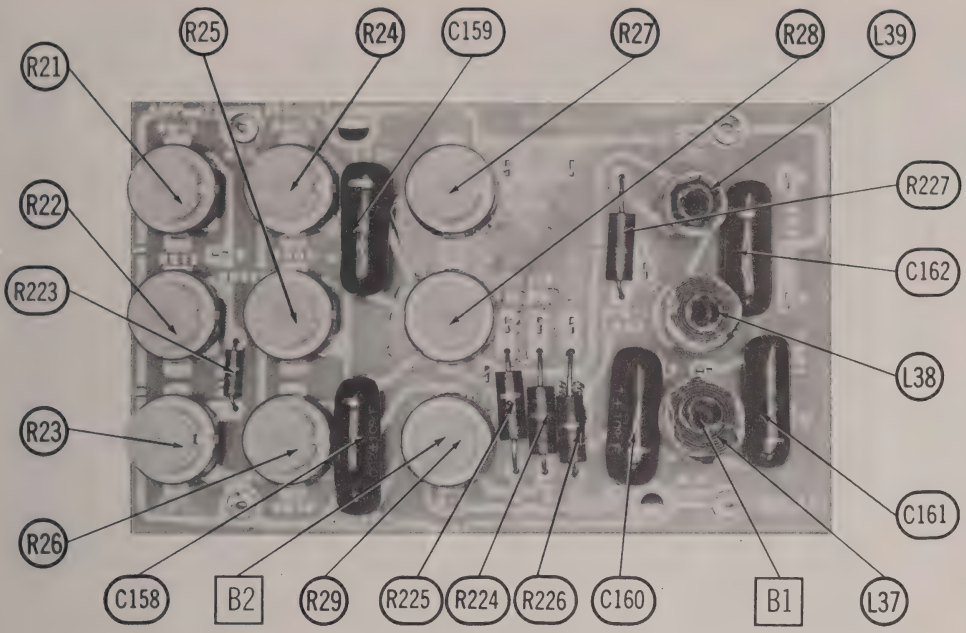
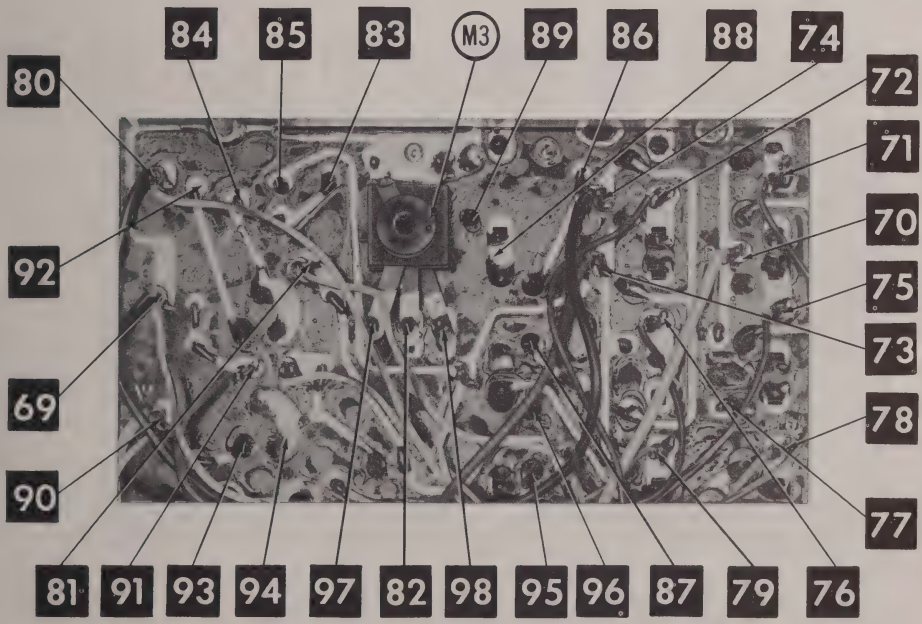
REMOTE CONTROL RM-301

TV CHASSIS 98C3 AUDIO OUTPUT, REMOTE CONTROL CONNECTIONS, PHONO INPUT CIRCUITS



CONVERGENCE PRINTED BOARD



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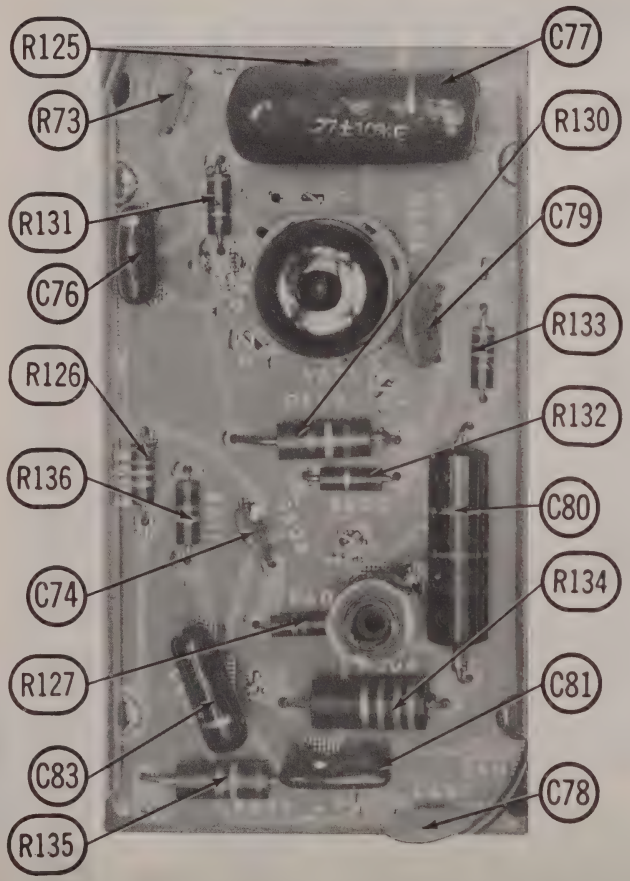
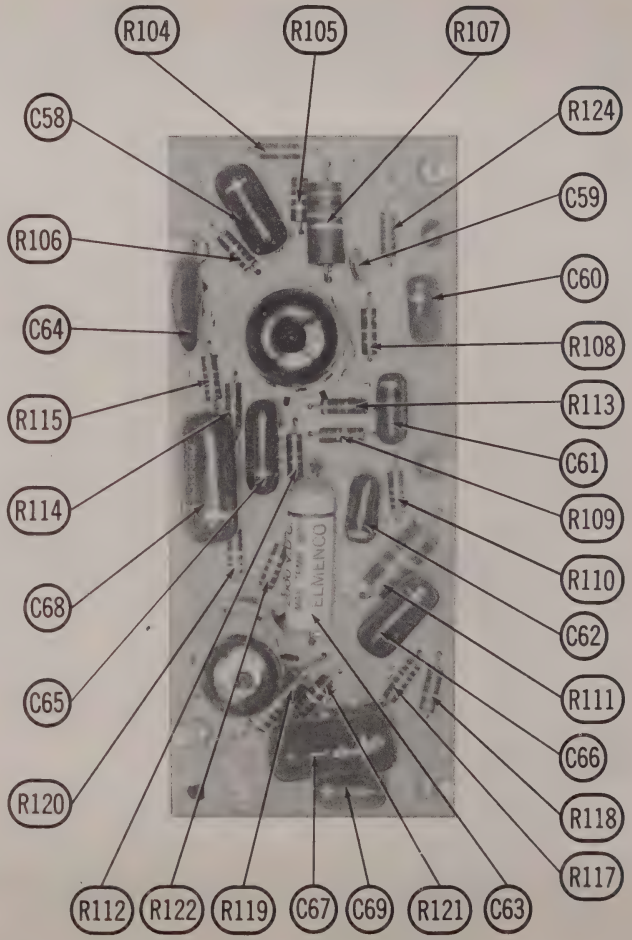
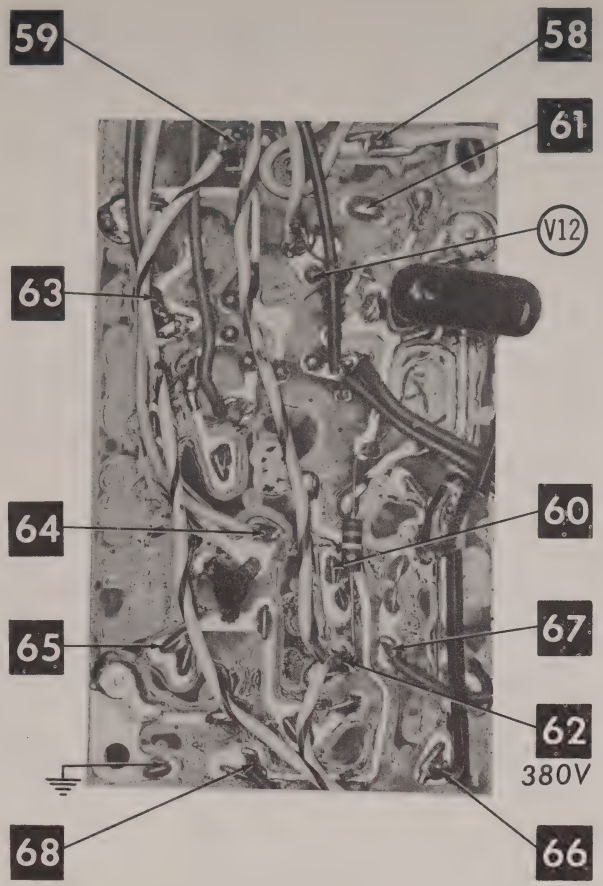
CONVERGENCE PRINTED BOARD



HORIZ. AFC -
HORIZ. OSC. PRINTED BOARD



VERT. OSC. - OUTPUT PRINTED BOARD



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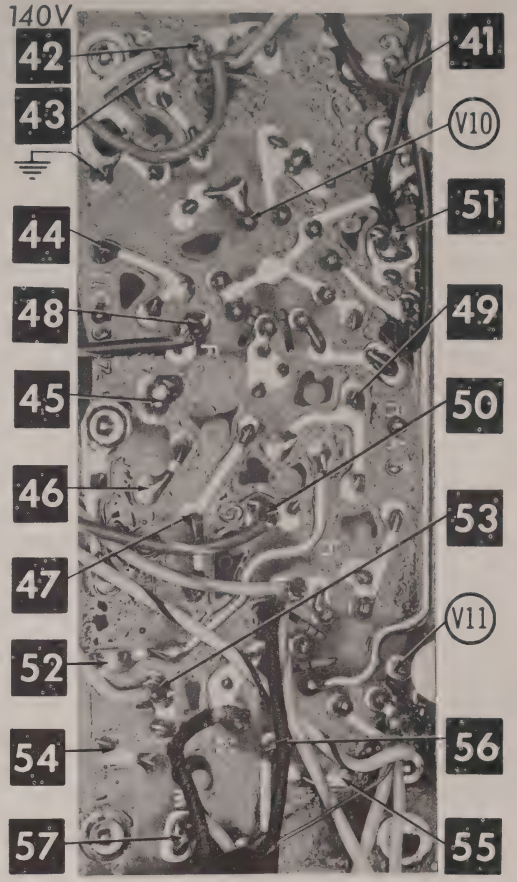
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

HORIZ. AFC - OSC. PRINTED BOARD



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ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VERT. OSC. - OUTPUT PRINTED BOARD

TV RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	100K	47Ω	FIL	FIL	†4000Ω	†4000Ω	0Ω		
V2	6BZ6	100K	82Ω	FIL	FIL	†4000Ω	†4000Ω	0Ω		
V3	6AW8A	0Ω	10meg	▪1meg	FIL	FIL	150Ω	.1Ω	†6800Ω	†6800Ω
V4	6AW8A	▪0Ω	● 60K	400K	FIL	FIL	900Ω	6000Ω	†23K	†7000Ω
V5	12BY7A	● 400Ω	●350K	NC	FIL	FIL	FIL	†4600Ω	†23K	0Ω
V6	6U8A	†25K	.1Ω	▪3300Ω	FIL	FIL	▪3300Ω	82Ω	1000Ω	● 1meg
V7	6AU6	100K	0Ω	FIL	FIL	▪3300Ω	▪18K	120Ω		
V8	6BN8	INF	0Ω	INF	FIL	FIL	24K	†440K	1meg	0Ω
V9	6AQ5A	200K	¶ 30K	FIL	FIL	†600Ω	†820Ω	200K		
V10	6CG7	▪10K	30K	0Ω	FIL	FIL	● †5meg	2.3meg	0Ω	0Ω
V11	6AQ5A	NC	20Ω	FIL	FIL	†3100Ω	†2700Ω	2.4meg		
V12	6CG7	● †65K	330K	†500K	FIL	FIL	†33K	550K	0Ω	0Ω
V13	6DQ5	10meg	FIL	0Ω	†12K	10meg	0Ω	FIL	†12K	TOP CAP †15Ω
V14	6AX4GT	NC	NC	350K	NC	†32Ω	NC	FIL	FIL	
V15	3A3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †600Ω
V16	1V2	NC	NC	NC	66meg	66meg	TP	NC	NC	†100K
V17	6BK4	† 1000Ω	FIL	NC	NC	● 1meg	NC	FIL	NC	TOP CAP INF
V18	6U8A	150K	470K	†13K	FIL	FIL	†13K	0Ω	0Ω	4.5meg
V19	6AW8A	330Ω	100K	†23K	FIL	FIL	10K	5600Ω	†1800Ω	†1800Ω
V20	6BN8	2meg	270Ω	2.8meg	FIL	FIL	270Ω	4.2meg	4.2meg	2.8meg
V21	6U8A	†12K	47K	†48K	FIL	FIL	†1800Ω	0Ω	680Ω	2.4meg
V22	12AZ7	†6400Ω	1Ω	1500Ω	FIL	FIL	†6400Ω	1Ω	1500Ω	FIL
V23	12BH7A	†15K	1meg	560Ω	FIL	FIL	†12K	1meg	560Ω	FIL
V24	12BH7A	†39K	120K	330Ω	FIL	FIL	†12K	1meg	560Ω	FIL
V25	21CYP22A	FIL	†130K	● †160K	†7200Ω	†3600Ω	†120K	● †160K	Pin 9 67meg	Pin 11 ● †160K
		Pin 12 115K	Pin 13 †2700Ω	Pin 14 FIL						
V301	6ER5/GG	47Ω	400K	FIL	FIL	†5700Ω	0Ω	47Ω		
V302	6CG8A	10K	†17K	0Ω	FIL	FIL	†5700Ω	†27K	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M1. ▪ MEASURED FROM PIN 2 OF V9.
† MEASURED FROM PIN 3 OF V14. NC NO CONNECTION TP TIE POINT

MISCELLANEOUS ADJUSTMENTS

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested Alignment Tools:
B3, B4 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295, 9440
WALSCO #2546, 2547

Connect a 0 to 500MA meter in series with the cathode circuit of the Horizontal Output tube. Connect a .47mfd capacitor across the meter terminals. Connect a VTVM across the test resistor (R153) in the cathode circuit of the HV Regulator tube. Connect the high side of the scope thru a low capacity probe to point (M). Low side to chassis.
Connect the DC probe of a VTVM thru a high voltage probe to high voltage rectifier "cup". Common to chassis. Set Focus control fully counterclockwise. Set Horizontal Hold and Horizontal Drive to the center of their ranges. Set the High Voltage Adjust at two thirds clockwise rotation.
Tune the receiver to a station and synchronize the picture with the Horizontal Hold Range (Freq.) Slug (B3).
Adjust Horizontal Waveform slug (B4) for waveform similar to Fig. 8 with round and sharp peaks of equal amplitudes. Keep the picture in sync during this adjustment with B4.
Adjust the Horizontal Linearity slug (B5) for MINIMUM current indication on the 500MA meter. Then turn B5 one half turn clockwise (toward Max. inductance).
Adjust the Horizontal Drive control for maximum current without the presence of drive lines in the picture but not to exceed 180MA.
Adjust the High Voltage Adjust for 23KV on the high voltage VTVM.
The voltage across R153 should be at least . 85 volts (850 microamps).

AGC ADJUSTMENT

Tune in the strongest station in the area. Connect a scope to point (E). Low side to chassis. Adjust the AGC control for 10 volts peak to peak on the scope.

NOISE INVERTER ADJUSTMENT

Connect the vertical amplifier of the scope to point (D). Low side to chassis. Turn the ANI control fully counterclockwise. Turn slowly clockwise while observing the scope. When the tips of the sync appear to be clipped, turn counterclockwise until clippling just disappears.

COLOR AFC ALIGNMENT

Connect the vertical amplifier of the scope to TP-2. Low side to chassis. Connect the DC probe of the VTVM thru a 470K resistor to pin 6 (plate) of Phase Detector (V20). Common to chassis. Set the Hue control to the center of its range. Turn the Killer Threshold control fully counterclockwise. Preset A20 one half turn from tight. Connect a short clip lead from point (N) to chassis. Adjust A16 and A17 for maximum deflection on the VTVM. If the Chroma Reference Oscillator is not running, no reading will be obtained. In which case, adjust A19 to start the Oscillator then adjust A16 and A17. Adjust A18 for maximum deflection on the VTVM. Make sure the Oscillator is running and locked in.
Connect a clip lead from TP-5 to chassis. Disconnect the VTVM from the Phase Detector. Adjust A19 until the color bars stand still on the screen or drift slowly. Move the scope connection to TP-2. Low side to chassis. Remove the clip lead from TP-5. Observe the bar pattern on the scope and retouch A18 if necessary, to obtain proper response curve similar to R-Y signal in Fig. 9 with equal change when rotating the Hue control from one end to the other. After this adjustment, return the Hue control to its normal setting. Move the scope connection to TP-3. If necessary, retouch A16 for correct B-Y signal as shown in Fig. 9.
Connect a clip lead from pin 7 (grid) of the Burst Amplifier to chassis. Connect another clip lead from pin 9 (grid) of the Color Killer to chassis. Reconnect the DC probe of the VTVM to pin 7 of the Phase Detector. Adjust A20 for zero volts on the VTVM. A positive and a negative reading will be found on either side of the correct setting. Recheck the setting of A16 by observing the B-Y waveform. Recheck the setting of A20. Check the G-Y waveform by connecting the scope to TP-4 and compare to the G-Y waveform in Fig. 9. Disconnect all clip leads and test equipment. Switch to an unused channel and adjust the Killer Threshold control to the point where color just disappears from the noise pattern on the screen.

PRELIMINARY CONVERGENCE ADJUSTMENTS

Connect the RF output of a white dot generator to the antenna terminals. Preset all Red, Green, and Blue Horizontal and Vertical Convergence controls and coils to the center of their ranges.
Adjust the Red, Green, and Blue Convergence Magnets and the Lateral Magnet to produce a white dot in the center of the screen. Keep the receiver in sharp focus while making this adjustment. Switch the generator to standby position.

COLOR PURITY ADJUSTMENTS

If necessary, demagnetize picture tube and associated components. Set the red tabs of the Purity Magnet together. Set the Edge Purity Magnets so that the two magnets are in the same relative position one above the other.
Loosen the yoke clamp and slide the deflection yoke to the rear as far as possible.
Shunt test points(TP-2 and TP-5)to chassis thru individual 100K resistors. Slide the Purity Magnet around the neck of the picture tube and at the same time spread the red tabs apart to produce a uniform red screen area at the center of the screen.
Move the yoke forward and adjust for best overall red screen without neck shadow. Adjust so that any color impurities occur at the extreme edge of the raster.
Adjust the Screen controls for a white raster and adjust the Edge Purity Magnets for best edge purity. Maximum correction is obtained with the open ends of the magnets 180 degrees apart. Rotate both magnets simultaneously to achieve the desired results.

VERTICAL CONVERGENCE ADJUSTMENTS

Recheck the "Preliminary Convergence Adjustments" for correct settings of the Red, Blue, and Green Magnets and Lateral Magnets to produce a white dot in the center of the raster.
Loosen the two screws holding the convergence board, slide the board to the left and remove. Fasten the board to the two screws provided on the top rail of the cabinet with the controls facing forward so that convergence adjustments may be made from the front of the receiver. Slots are provided in the lower edge of the board for making this mounting. Switch the dot generator to the vertical white bars and adjust the Red and Green Tilt controls for equal displacement of the center bar at the top and bottom. Adjust Red and Green Vertical Amplitude controls until the red and green lines are straight.
Gradually reduce the amplitudes to converge the red, green, and blue along the center lines, retouching the Red and Green Tilt controls to keep the lines parallel. The center lines should converge to produce a white vertical line from top to bottom or should show slight displacement of the red at one side, the green at the other with all three lines parallel from top to bottom. Readjust the convergence magnets if necessary to superimpose the three parallel lines to produce a single white line from top to bottom.
Switch the generator to the horizontal bars. Referring to the top and bottom bars as a reference, adjust the Blue Vertical Tilt, and Amplitude controls for equal downward displacement of the blue horizontal from the extreme top and bottom lines at the top center and bottom center of the raster. Reduce the Blue Vertical Amplitude control to converge all lines at the center, retouching the Blue Vertical Tilt SLIGHTLY, if necessary making all white lines at the center from top to bottom.

HORIZONTAL CONVERGENCE ADJUSTMENTS

Switch the generator to crosshatch pattern. If necessary, retouch convergence magnets to produce good convergence at the center of the screen.

Adjust coil B-1 so that the blue horizontal line at the right center of the raster is a straight line.
Adjust control B-2 for a straight blue line to the left side of the raster.
Adjust R-G-1 to make the vertical lines at the right side of the raster converge. Adjust R-G-2 to make the horizontal red and green lines at the right side of the screen converge. Readjust B-1 to make the blue line at the right center fall on red and green converged lines. Retouch R-G-1 for convergence of vertical lines at the right side.
Adjust control R-G-3 to make vertical lines at the left side converge.
Adjust control R-G-4 to make the red and green horizontal lines at the left side of the screen converge.
The picture or pattern should now show proper convergence over the entire screen.

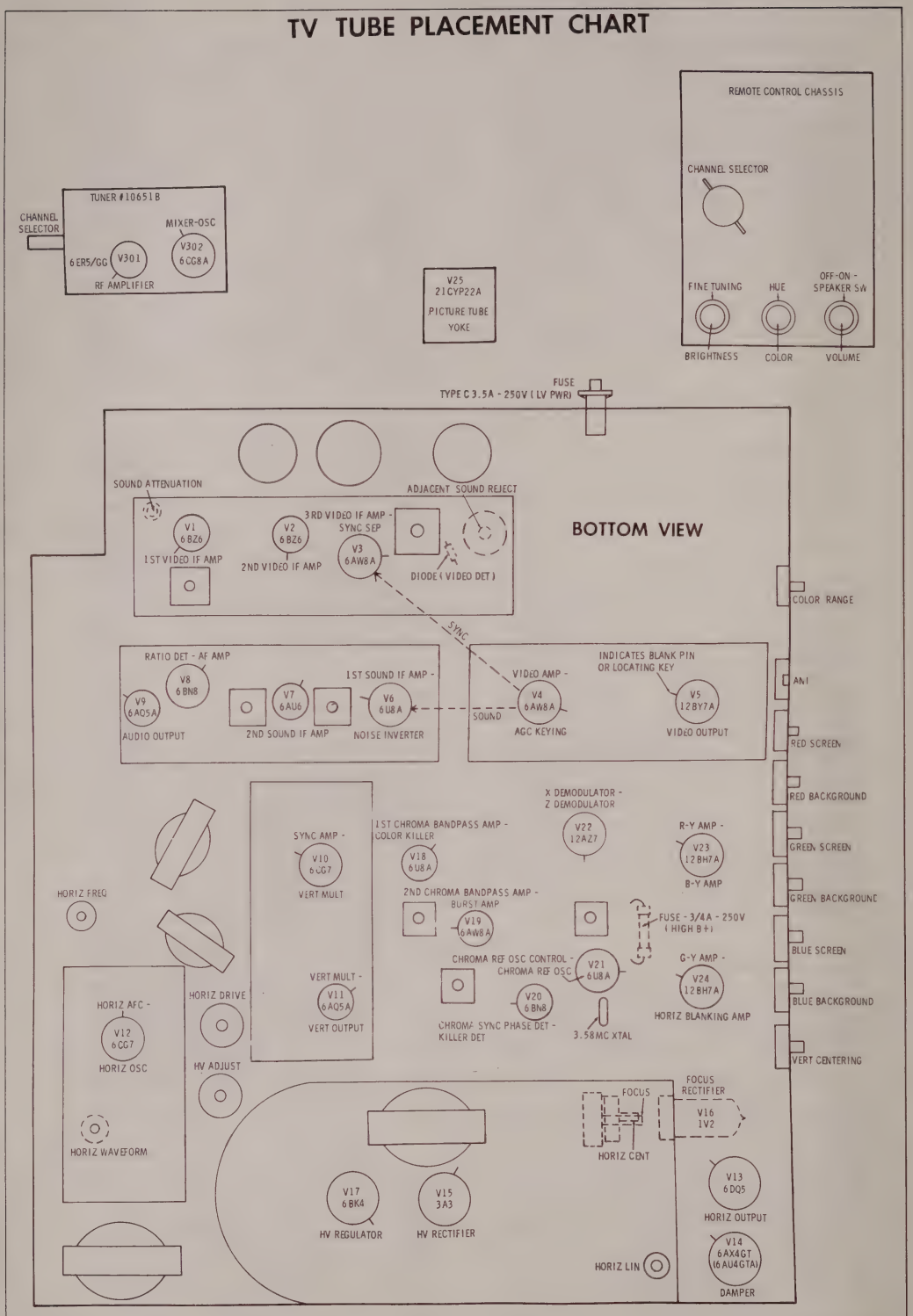
GRAY SCALE ADJUSTMENT

Set the Screen controls fully clockwise and the Background controls fully counterclockwise. Turn the Brightness and Contrast controls fully counterclockwise after tuning in a station signal. Use a program which displays the full range of contrast from low lights to high lights. Advance the Brightness control to obtain a picture just SLIGHTLY below normal brightness level, the control will usually fall at approximately two-thirds from fully counterclockwise. Be careful not to advance the Brightness to close to overload. If the picture appears to be too dim at the above setting, advance the Contrast control SLIGHTLY. Adjust Red, Blue, and Green Background controls to produce white in the high light areas of the picture.
One screen control will be left at fully clockwise rotation. Which one will be determined as follows:

1. Yellow in lowlight areas. Blue Screen should remain at maximum.
2. Cyan in lowlight areas. Red screen should remain at maximum.
3. Magenta in lowlight areas. Green Screen should remain at maximum.
4. Red, green or blue in lowlight areas. This condition indicates that the Screen control of the color appearing is too high and must be reduced from maximum. Turn this Screen control down slowly. One of the following conditions will occur:
   a. If the picture becomes gray the two remaining Screens should remain at maximum setting and the Background control for the Screen turned down should be adjusted (with the Brightness control set for normal brightness) to produce white in the highlight areas. The raster should stay white (track) at all brightness levels. Recheck at low level and if necessary, retouch SLIGHTLY the screen control that was previously turned down to achieve gray in the lowlight areas. No further adjustments are required and the balance of this procedure does not apply.
   b. Yellow in the lowlight areas. Blue Screen should remain at maximum.
   c. Cyan in lowlight areas. Red Screen should remain at maximum.
   d. Magenta in lowlight areas. Green Screen should remain at maximum.

From this point on do not adjust either the Screen or Background control for the color which remains at maximum position. THIS IS IMPORTANT.
Turn the Brightness to a low level and adjust the two remaining Screen controls to produce a gray picture in the lowlight areas.
Advance the Brightness to normal brightness level and adjust the two remaining Background controls for white in the highlight areas.
Check for proper gray scale at all brightness levels. It may be necessary to retouch SLIGHTLY the two Screen controls at lowlight and the Background controls at highlight, remembering not to adjust either the Screen or Background controls for the color set at maximum.

TV TUBE PLACEMENT CHART



TV PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE
V1	1st Video IF Amp.	6BZ6
V2	2nd Video IF Amp.	6BZ6
V3	3rd Video IF Amp.- Sync Separator	6AW8A
V4	Video Amp.- AGC Keying	6AW8A
V5	Video Output	12BY7A
V6	1st Sound IF Amp.- Noise Inverter	6U8A
V7	2nd Sound IF Amp.	6AU6
V8	Ratio Detector - AF Amp.	6BN8
V9	Audio Output	6AQ5A
V10	Sync Amp.- Vert. Mult.	6CG7
V11	Vert. Mult.- Vert. Output	6AQ5A
V12	Horiz. AFC - Horiz. Osc.	6CG7
V13	Horiz. Output	6DQ6
V14	Damper	6AX4GT (6AU4GTA)*
V15	HV Rectifier	3A3
V16	Focus Rectifier	1V2
V17	HV Regulator	6BK4
V18	1st Chroma Bandpass Amp. -Color Killer	6U8A
V19	2nd Chroma Bandpass Amp. -Burst Amp.	6AW8A
V20	Chroma Sync Phase Det.- Killer Det.	6BN8
V21	Chroma Ref. Osc. Control- Chroma Ref. Osc.	6U8A
V22	X Demodulator - Z Demodulator	12AZ7
V23	R-Y Amp.- B-Y Amp.	12BH7A
V24	G-Y Amp.- Horiz. Blanking Amp.	12BH7A

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	Packard-Bell PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V25	21CYP22A		21CYP22A			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	160	250	24198	AFH1-31-75	XA0315	WP131.5	TMS-1480	TVL-1540	
C2A	▲160	250	24196	AFHS3-178-60		FP341.6	TMD-2655	TVLS-3711.2*	
B	■50	450					TD-150-300		
C	▲50	50							
C3A	▲80	450	24197	AFH3-182-80		FP342.8	TMD-2425	TVLS-3723.7*	
B	■50	350					TD-80-450		
C	▲100	200							
C4	5	50	24038	PRS1310	BBR5-50	TC30	TD-5-50	TVA-1303	
C5	2	350	24127	PRS1705	BR245	TC595	TD-2-450	TVA-1701	
C6	40	25	24195	PRS1470	BR4015	TC48	TD-40-150	TVA-1413	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

ITEM No.	RATING			REMARKS	REPLACEMENT DATA					
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C8	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C9	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C10	9	NPO			NPO-SI 10	TCZ-10	C10V9C	CCTO-100	CNO-410	10TCC-Q10
C11	150	NPO	5%		NPO-DI 150	DTZ-150	C10T15C		CNO-315	10TCC-T15
C12	680	N2200	10%	#23886				*		
C13	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C15	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C16	.022	200V			P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	2TM-S22
C17	330	N1500	10%	#23686				*		
C18	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C19	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C20	2		5%		NPO-SI 2.0	TCZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C21	560	N150	5%	#23688				*		
C22	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C23	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C24	.0015				BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C25	22	NPO	10%		NPO-DI 22	DTZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C26	10	NPO	10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C27	100	N030	5%	#23691				*		
C28	.001		10%		DI-1000	DD-102	5R5T1	CCD-102	GP210	10TS-D10
C29	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C30	.22	200V			P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C31	390		10%		DI-390	DD-390	L10T39	CCD-391	GP339	10TS-T39
C32	.0015		10%		DI-1500	DD-152	5R5D15	CCD-152	GP215	10TS-D15
C33	.001	1600V			P1684CM-001	DD30-102	CUB18D1	16DP-1-102	UAC-210	BL-D10
C34	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	1.5	N3300	5%	#23867				*		
C36	10	NPO	10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TS-Q10
C37	5				NPO-SI 5.0	TCZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C38	75	N750			N750-DI 75	DTN-75	C10Q75U	CCTN-750	CN7-475	10TCU-Q75
C39	.005				BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C40	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C41	47	NPO	10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C42	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C43	.0015		10%		DI-1500	DD-152	5R5D15	CCD-152	GP215	10TS-D15
C44	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C45	.0012		10%		DI-1200	DD-121	5R5D12	CCD-122	GP212	10TS-D12
C46	.022				BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C47	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C48	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C49	.022	400V		Note 1	P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C50	.1	600V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C51	.0033	600V	10%		V84C6D33-10%		PM6D33	6DP-1-332	GEM-16233	6TM-D33
C52	.0047	600V		Note 2	P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C53	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C54	.01				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C55	.01	400V	10%		V84C4S1-10%		PM4S1	4DP-1-103	GEM-1611	4TM-S10
C56	33	N750	10%		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33

TV PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING			REMARKS	REPLACEMENT DATA					
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C57	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C58	.033	600V			P688N-033	DD-303	CUB6S33	6DP-3-333	GEM-6133	6TM-S33
C59	390		10%		DI-390	DD-391	L10T39	CCD-391	GP339	10TS-T39
C60	.01	400V	10%		V84C4SI-10%		PM4SI	4DP-1-103	GEM-1611	4TM-S10
C61	.0082	400V	10%		V84C6D82-10%		DPMS6D82	6DP-1-822	GEM-16282	6PS-D82
C62	.0056	400V	10%				DPMS6D56	6DP-1-562	GEM-16256	6PS-D56
C63	.001	2000V	10%	#23757						
C64	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C65	.01	600V	10%		V84C6SI-10%		PM6SI	6DP-4-103	GEM-1611	6TM-S10
C66	.033	400V	10%		V84C4S33-10%		PM6S33	4DP-3-333	GEM-1613	6TM-S33
C67	.12	400V	10%	#23700-176						
C68	.056	600V	10%		P684CM-057		DPMS6S56	6DP-3-563		6PS-S56
C69	.01	400V	10%		V84C4SI-10%		PM4SI	4DP-1-103	GEM-1611	4TM-S10
C70	.47	200V			P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C71	.47	200V			P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C72	68	2000V	10%				HVA20Q68	VCM-20-680K	2DY-468	
C73	22	N750	10%		N750-DI 22	DTN-22	C10Q22U	CCTN-220	CN7-422	10TCU-Q22
C74	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C75	.047	600V			P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C76	.0033	600V			P688N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C77	.27	400V	10%	#23700-180				4DP-5-274		
C78	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C79	390	1000V	N220 5%	#24522				*		
C80	.01	600V	5%	#23758	V84C6SI-5%					
C81	680		5%		1469-00068		5R5T68	CM-19B-680J	MCJ249	MS-368
C82	.0033	600V			P688N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C83	.01	600V			P688N-01	D6-103	CUB6SI	6DP-2-103	GEM-611	6TM-S10
C84	.1	600V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C85	.047	600V			P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C86	.047	600V			P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C87	.47	200V			P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C88	.47	200V			P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C89	22	1000V	N470	#23697				*		
C90	56	6000V			HVD-60-56	DD60-560		6CCD-560	6DY-456	60GA-Q56
C91	.0033	600V			P688N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C92	.15	200V	10%		V84C2P15-10%		PM2P15	2DP-3-154	GEM-2015	2TM-P15
C93	.1	600V	10%		V84C6P1-10%		PM6P1	6DP-4-104	GEM-1001	6TM-P10
C94	560	2500V	10%					VCM-35-561K		
C95	100	3000V	5%							
C96	560	2500V	10%					VCM-35-561K		
C97	47	4000V			HVD-60-47	DD60-470	HVA50Q47	6CCD-470	6DY-447	60GA-Q47
C98	100	2000V	10%					VCM-20-101K	2DY-310	30TCY-T10
C99	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C100	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C101	2	NPO	5%		NPO-DI 2.0	DI-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C102	330		10%		DI-390	DD-331	L10T33	CM-19B-331K	GP333	10TS-T33
C103	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C104	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C105	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C106	120	N2200	10%	#24501				*		
C107	47	NPO	10%		NPO-DI 47	DTZ-47	C10Q47C	CCTN-470	CNO-447	10TCC-Q47
C108	330		5%		1469-00033		5R5T33	CM-19B-331J	MCE241	MS-333
C109	5	NPO	5%		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C110	330		5%		1469-00033		5R5T33	CM-19B-331J	MCE241	MS-333
C111	180	N750	5%			TCN-180	C10T18U		CN7-318	10TCU-T18
C112	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C113	.0047				BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C114	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C115	4	NPO	±.5mmf		NPO-DI 4.7	DTZ-4R7	C10V4C	CCTO-4R7	CNO-547	10TCC-V39
C116	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C117	15	NPO	10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	B-220	10TCC-Q15
C118	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C119	220	N750	10%		N750-DI 220	DTN-220	C10T22U	CCTN-221	CN7-322	10TCU-T22
C120	82	NPO	10%		NPO-DI 82	DTZ-82	C10Q82C	CCTO-820	CNO-482	10TCC-Q82
C121	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C122	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C123	10-180			#23442				463		
C124	330		5%		1469-00033		5R5T33	CM-19B-331J	MCE241	MS-333
C125	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C126	.001		10%		DI-1000	DD-102	5R5DI	CCD-102	GP210	10TS-D10
C127	27	N150	10%	#24500				*		10TCP-Q27
C128	27	NPO	10%		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C129	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C130	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C131	560		10%		DI-560	DD-561	5R5T56	CCD-561	GP356	10TS-T56
C132	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C133	.22	400V			P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C134	.01	400V	10%		V84C4SI-10%		PM4SI	4DP-1-103	GEM-1611	4TM-S10
C135	.15	400V			P488N-15		CUB4P15	4DP-4-154	GEM-4015	4TM-P15
C136	7	N750	10%				C10Q7C		CN7-568	10TCC-V68
C137	22	NPO	10%		NPO-DI 22	DTN-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C138	.01	400V	10%		V84C4SI-10%		PM4SI	4DP-1-103	GEM-1611	4TM-S10
C139	.15	400V			P488N-15		CUB4P15	4DP-4-154	GEM-4015	4TM-P15
C140	22	NPO	10%		NPO-DI 22	DTN-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C141	.047	400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C142	.01	400V	10%		V84C4SI-10%		PM6SI	4DP-1-103	GEM-1611	4TM-S10
C143	.15	400V			P488N-15		CUB4P15	4DP-4-154	GEM-4015	4TM-P10
C144	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C145	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C146	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C147	.001				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C148	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C149	.01				BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C150	.005				BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C151	.047	400V			P488N-047	DD-503	CUB4SI	4DP-3-473	GEM-4147	4TM-S47
C152	.47	200V		Note 1	P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C153	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C154	.002				BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C155	.047	200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C156	.1	200V		Note 1	P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C157	.1	200V		Note 1	P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C158	.082	200V	10%				DPMS6S82	6DP-4-823		6PS-S82
C159	.1	200V	10%		V84C2P1-10%		PM2P1	2DP-3-104	GEM-201	2TM-P10
C160	.1	200V	10%		V84C2P1-10%		PM2P1	2DP-3-104	GEM-201	2TM-P10

TV PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C161	.1 200V 10%		V84C2P1-10%		PM2P1	2DP-3-104	GEM-201	2TM-P10
C162	.056 200V 10%		P884CM-057		DPMS6S56	6DP-3-563		6PS-S56

Note 1. Not used in Chassis 98C3. Note 2. .01mfd used in early versions. # Packard-Bell Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	100K	½	25631 ①					Horiz. Hold
B	5meg	½						Height
R2A	2.5meg	½	25608					Vert. Hold
B	1meg	½						Killer Threshold
R3A	500Ω	½	25607					Contrast
B	100K	½						Vert. Linearity
R4A	1meg	½	25617	TT-69	B47-1meg-S	B11-137	TA16L	AGC
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R5A	700K	½	25612	TT-66	A47-750K-S	B11-136	PTA754L	Brightness Range
B	Shaft			Not Req.	FKS-1/4	TM4	Not Req.	
R6A	500Ω	½	25624	B-4	A47-500-S	Q11-103	U2	Color Range
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R7	2.5meg	½	25610	TT-83	B47-2.5meg-S	HLC-2	TA255L	ANI
R8A	1meg	½	25611	TT-69	B47-1meg-S	B11-137	TA16L	Red Screen
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R9A	700K	½	25612	TT-66	A47-750K-S	B11-136	PTA754L	Red Background
B	Shaft			Not Req.	FKS-1/4	TM4	Not Req.	
R10A	1meg	½	25611	TT-69	B47-1meg-S	B11-137	TA16L	Green Screen
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R11A	700K	½	25612	TT-66	A47-750K-S	B11-136	PTA754L	Green Background
B	Shaft			Not Req.	FKS-1/4	TM4	Not Req.	
R12A	1meg	½	25611	TT-69	B47-1meg-S	B11-137	TA16L	Blue Screen
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R13A	700K	½	25612	TT-66	A47-750K-S	B11-136	PTA754L	Blue Background
B	Shaft			Not Req.	FKS-1/4	TM4	Not Req.	
R14A	15Ω	2(WW)	25613	WN-150	A58-15	WU-015X *	R15L	Vert. Centering
B	Shaft			Not Req.	FKS-1/4	SK4	Not Req.	
R15	100K	2(WW)	25616					Focus
R16	100Ω	1(WW)	25618				PFL100A	Horiz. Centering
R17A	250K	½	25615	TT-50	B47-250K-S	B11-130	TA254L	Horiz. Drive
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R18A	500K	½	25614	TT-59	B47-500K-S	B11-133	PTA55L	High Voltage Adjust
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R19	750Ω	½	25606					Sound Reject
R20	10K	1/4	25605					Adjacent Sound Reject
R21	120Ω	1(WW)	25620					Vert. Red Amp.
R22	120Ω	1(WW)	25620					Vert. Green Amp.
R23	120Ω	1(WW)	25620					Vert. Blue Amp.
R24	30Ω	1(WW)	25621					Vert. Red Tilt
R25	30Ω	1(WW)	25621					Vert. Green Tilt
R26	60Ω	1(WW)	25619					Vert. Blue Tilt
R27	60Ω	1(WW)	25619					Horiz. R-G-3
R28	60Ω	1(WW)	25619					Horiz. R-G-4
R29	120Ω	1(WW)	25620					Horiz. B-2

① Model 21CC3 uses 100K Horiz. Hold (Part #25631) and 500Ω Tone - 5 meg Height (Part #25609) * Do not use Tap.

SEE REMOTE CONTROL PARTS LIST RM-401 (PAGE 23) FOR R30, R31, R32.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R33	3900Ω 7W	PW7-3900	7W-SQ-3900		R69	39K			
R34	2.7meg 5%				R70	2700Ω			
R35	100K				R71	910Ω 3W 5%	PW3-910	3W-SQ-910	
R36	390K 5%				R72	910Ω 3W 5%	PW3-910	3W-SQ-910	
R37	330K 5%				R73	2700Ω 7W 5%	PW7-2700	7W-SQ-2700	
R38	330K 5%				R74	220Ω			
R39	3300Ω 5%				R75	68Ω			
R40	1000Ω				R76	1000Ω			
R41	150Ω				R77	82K 1W			
R42	47Ω 5%				R78	56K			Note 1
R43	1000Ω				R79	10K			
R44	100K 5%				R80	100K			
R45	150Ω				R81	3300Ω 1W			
R46	18K 4W	PW4-18K	4W-SQ-18K		R82	82Ω			
R47	3300Ω 10W	PW10-3300	10W-SQ-3300		R83	100K			
R48	82Ω 5%				R84	15K			
R49	100K				R85	3300Ω			
R50	470Ω				R86	120Ω			
R51	5600Ω 5W	PW5-5600	5W-SQ-5600		R87	10K			
R52	150Ω				R88	12K			
R53	12K 5%				R89	12K			
R54	8200Ω 5%				R90	1meg			Note 2
R55	3.9meg				R91	56K			Note 3
R56	6800Ω 7W 5%	PW7-6800	7G-6800		R92	220K			Note 4
R57	220Ω				R93	220K			Note 3
R58	150K				R94	820K 5%			
R59	22K 2W				R95	820K 5%			
R60	56Ω				R96	10Ω			
R61	1500Ω 5%				R97	3.3meg			
R62	47K				R98	1meg			
R63	1800Ω 5%				R99	100Ω			
R64	82K				R100	22K			Note 5
R65	270K				R101	39K			
R66	8200Ω				R102	180K			
R67	22K 2W				R103	10meg			
R68	56K				R104	1meg			

SCRIPTIONS (Continued)

CIRCUITS)

NT DATA				
Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.	NOTES
	HS-7			

HOKE

ENT DATA			
Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
		C-40X	

R (POWER)

MENT DATA			
Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES

(MOTOR)

IENT DATA			
Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
			① Alternate Part #89060A

WEEP CIRCUITS)

T DATA			
ncor T No	Thordarson PART No	Triad PART No.	NOTES

DIO OUTPUT)

DATA			
o.	Thordarson PART No.	Triad PART No.	NOTES
①	26S48	S-9Z	① Drill new mounting hole(s).

CTIFIERS

	SYLVANIA PART No.	NOTES
	SR500- ① SR500 ①	① Silicon Type ② Selenium Type

ES

CEMENT DATA			
TTELFUSE ART No.		BUSS PART No.	
	HOLDER	FUSE	HOLDER
/)	346007	C 3½	HC 2½ to 3½
A /)		GJV 3/4	

IODES

	SYLVANIA PART No.	NOTES
	1N64 1N64 1N295	RF AGC Diode Video Detector, Pigtail Sound Detector, Pigtail Audio Bias Clamper Burst Limiter ① Not used in Chassis 98C3.

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M12	Tuner	10651B	
M13	Crystal	72059	3.58MC
M14	Delay Line	29749	
M15	Switch	86077	Motor, Channel Selector
M16	Switch		Mating
M17	Magnet	56006	Lateral Assembly
M18	Magnet	56007	Purity Ring
M19	Magnet		Convergence (3 used)
	Printed Board	10656	Video IF
	Printed Board	10658	Vertical
	Printed Board	10659	Sync
	Printed Board	10661	Convergence
M20	Relay	72052A	Power (Ch. 98C4)
	Relay	72039	Power (Ch. 98C3)
M21	Relay	72064	Muting
	Switch	86712	Slide, Phono, Used in Chassis 98C3
M22	Motor	58067	Power Tuning

CABINETS & CABINET PARTS

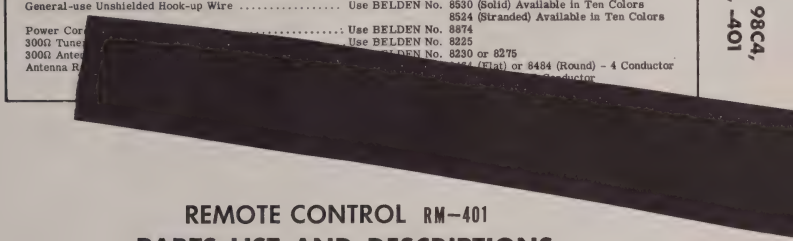
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

DESCRIPTION	PART NO.	MODEL NO. 21CC3	21CC3A	21CK1
Safety Glass	55142	X	X	X
Mask	55141	X	X	X
Dial Pointer-Radio	67049B			X
Lens, Knob-Radio	55115			X
Knob- Radio-Top-Tuning Function-Dimension	52306			X
Knob- Radio-Bottom-Tuning Function-Dimension	52284			X
Knob- Radio-Top, Bass, Treble, Loudness	52308			X
Knob- Radio-Bottom, Bass, Treble, Loudness	52278			X
Knob-VHF Channel Selector	52217H	X		
Knob- "	52339		X	X
Knob-Fine Tuning	52237B	X		
Knob-Fine Tuning-	52331		X	X
Knob-Volume-TV	52235C	X		

DESCRIPTION	PART NO.	MODEL NO. 21CC3	21CC3A	21CK1
Knob-Volume-TV-Inside Dual	52332		X	X
Knob- Brightness, Color Saturation	52236B	X		
Knob- Brightness, Inside Dual Color Saturation	52232		X	X
Knob-Hue	52237-1B	X		
Knob-Hue-Outside Dual	52331-1		X	X
Knob- Speaker, On-Off, Outside Dual	52331		X	X
Knob-Focus	52193	X	X	X
Knob- Horiz. Hold, Vert. Hold Contrast	52328			X
Knob- Horis. Hold, Vert. Hold, Contrast, Tone	52328	X	X	
Cabinet-Remote Control	21135-2J	X		
Cabinet-Remote Control-Top	21184-1C		X	X
Cabinet-Remote Control-Bottom	21185A		X	X

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cor	Use BELDEN No. 8874
300Ω Tune	Use BELDEN No. 8225
300Ω Ante	BELDEN No. 8230 or 8275
Antenna R	8484 (Flat) or 8484 (Round) - 4 Conductor



REMOTE CONTROL RM-401
PARTS LIST AND DESCRIPTIONS

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C163	.1 200V		P288N-1	DF-104	PM2P1	2DP-3-104	GEM-201	2TM-P10
C164	.1 200V		P288N-1	DF-104	PM2P1	2DP-3-104	GEM-201	2TM-P10

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R30A	Switch		25089					Speaker Selector, Off-On
B	50K							Volume
R31A	20K		25623					Hue
B	500Ω						■ UE4231	Color
R32A	50K		25622					Fine Tuning
B	250K							Brightness

■ "STA-LOC" Equivalent: FA24R, RU52L, OS687, IS1187.

REMOTE CONTROL RM-401
PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Packard-Bell PART No.	QUAM PART No.	
SP1	2½"	PM	3-4Ω	83136	25A07	

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M23	Switch	86824A	Selector

FM-AM TUNER PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			• RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V26	FM RF Amp.	6BA6	V31	FM Limiter - AM Det.	6AU6
V27	FM Mixer - FM Osc.	12AT7	V32	Channel 1 AF Amp. - Channel 2 AF Amp.	7025
V28	FM AFC	6AV6			
V29	AM Converter	6BE6	V33	Channel 1 Cath. Follower - Channel 2 Cath. Follower	7025
V30	FM-AM IF Amp.	6BA6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C165A	30	450	24177	AFH2-52	B0410	FP259	TMD-2630	TVL-2757	
B	10	450							
C166	5	50	24164A	PTT90	NLW5-50	TC30	MLV5-50	TE-1303	
C167	40	10	24151C	PTT44	NLW40-10	TT15X40	MLV40-12	TE-1133	

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C168	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C169	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C170	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C171	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C172	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C173	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C174	1.5	10%	NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C175	68 NPO	5%		DTZ-68	C10Q68C		CNO-468	10TCC-Q68
C176	1.5-10		#23430	829-10				
C177	10 N330	5%	#23896			*		10TCS-Q10
C178	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C179	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C180	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C181	.05		BPD-05	DD-503	CUB285	4DP-3-503	GP150	5HK-S50
C182	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C183	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C184	1.5	10%	NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C185	.05		BPD-05	DD-503	CUB285	4DP-3-503	GP150	5HK-S50
C186	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C187	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C188	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C189	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C190	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C191	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C192	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C193	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C194	100	10%	DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C195	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C196	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C197	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C198	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C199	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C200	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C201	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C202	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C203	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C204	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C205	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C206	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C207	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C208	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C209	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C210	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C211	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C212	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10

Packard-Bell Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FM–AM TUNER PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS–IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R227A	1meg 150K Tap	½	25096A					Loudness, Channel 2
B	1meg 150K Tap	½						Loudness, Channel 1
C	Switch							Push-Pull AFC Off–On
R228A	1meg	½	25542	F1-52		† QJ-1545	▲ UF4232	Treble, Channel 2
B	1meg	½		R2-52				Treble, Channel 1
R229A	1meg	½	25542	F1-52		† QJ-1545	▲ UF4232	Bass, Channel 2
B	1meg	½		R2-52				Bass, Channel 1
R230A	5meg	½	25996B			B17-141		Dimension
B	Switch					SK7		Push-Pull Dimension Off–On

† "CONCENTRIKIT" Equivalent: K-2 Kit with Base Elements and Shafts: B13-137, P10-110 (Panel)
(Not available as a factory assembled unit.) B13-137, R1-130 (Rear)

▲ "STA-LOC" Equivalent: FA16A, RU16A, OS1312, IS1937

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R231	22K 1W			
R232	1000Ω			
R233	68Ω			
R234	3.3meg			
R235	10Ω			
R236	1000Ω			
R237	22K			
R238	27K			
R239	10Ω			
R240	22K			
R241	15K 2W			
R242	1000Ω			
R243	22K 1W			
R244	68Ω			
R245	2.2meg			
R246	47K			
R247	470K			
R248	18K 1W			
R249	33K			
R250	150K			Note 1

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R251	1meg			
R252	270K			
R253	220K			
R254	22K			
R255	68K			
R256	10K			
R257	33K			
R258	150K			Note 1
R259	1meg			
R260	270K			
R261	220K			
R262	22K			
R263	68K			
R264	10K			
R265	1200Ω			
R266	1meg			
R267	1800Ω			
R268	10K			
R269	100K			

Note 1. 220K used in early versions.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Packard-Bell PART No.	REPLACEMENT DATA
K1	Ratio Detector Network	300mmf, 300mmf, 300mmf, .001mfd, 68Ω, 1000Ω, 1500Ω, 6800Ω, 6800Ω, 68K	23627A	Aerovox PA-694 Centralab PC-342 Sprague C-12

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Packard-Bell PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L42	FM Ant. Trans.	29426C					
L43	RF Choke (luh)	29124	BC-561	4602	RTC-8515	T855	
L44	FM RF	29165					
L45	FM Osc.	29243A					
L46	RF Choke (luh)	29124	BC-561	4602	RTC-8515	T855	
L47	1st FM IF	29148	FM-254	1463	RTC-8599	T633	
L48	Loopstick	29364	BC-419	705-A		T532	
L49	AM Osc.	29247B	BC-393	71-OSC	RTC-8648	T510	
L50	1st AM IF	29077	BC-352	12-C1	RTC-8632	T607	
L51	2nd FM IF	29152	FM-254	1463	RTC-8599	T632	
L52	2nd AM IF	29078	BC-353	12-C2	RTC-8633	T608	
L53	Ratio Detector	29084	FM-255	1465	RTC-8600	T635	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Packard-Bell PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M24	1N541 *	72027		1N295	1N295	*Matched Pair (FM Detector, Pigtail)
M25	1N541 *	72027		1N295	1N295	
M26	1N295	72028		1N295	1N295	(AFC Diode, Pigtail)

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA Packard-Bell PART No. CARTRIDGE	Packard-Bell PART No. NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE*	NOTES
M27	PB-63048	Not Req.	13TX	Not Req.	13	Not Req.	8TA-S	N-8TA-S *	

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M28	Tuning Gang (FM-AM)	23561	AM Ant. 24-324mmf, Osc. 14-120mmf)
M29	Switch	86090	Selector

AMP PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆)
V34	Channel 1 AF Amp. - Phase Inverter	12AU7A
V35	Channel 1 Output	6BQ5 (EL84) *
V36	Channel 1 Output	6BQ5 (EL84) *
V37	Channel 2 AF Amp. - Phase Inverter	12AU7A
V38	Channel 2 Output	6BQ5 (EL84) *
V39	Channel 2 Output	6BQ5 (EL84) *
V40	Rectifier	5U4GB

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C213	40	450	24143	PRS1750	BR4045	TC78	TD-40-450	TVA-1712	
C214A	▲40	450	24147	AFH3-43-50	C0344	FP376.9	TMT-3745	TVL-3786	
B	■40	450							
C	▲20	450							
C215	250	25	24144	PRS1280	BR2501	TC50025	TD-250-25	TVA-1208	
C216	5	25NP	24126	PRS7405	BBR4-150	TCN505		TVANS-1303.1*	
C217	5	25NP	24126	PRS7405	BBR4-150	TCN505		TVANS-1303.1*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C218	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C219	330		DI-330	DD-331	L10T33	CCD-331	B-333	10TS-T33
C220	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C221	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C222	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C223	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C224	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C225	330		DI-330	DD-331	L10T33	CCD-331	B-333	10TS-T33
C226	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C227	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C228	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C229	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C230	.02 1400V		P1684CM-02		CUB1682	16DP-4-203	GEM-1612	MB-52
C231	.05 600V		P688N-05	DD-503	CUB655	6DP-3-503	GEM-615	6TM-S50

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R270	470K			
R271	470K			
R272	1800Ω			
R273	100K			
R274	100K			
R275	470K			
R276	470K			
R277	100K			
R278	470K			
R279	470K			
R280	1800Ω			
R281	100K			
R282	100K			
R283	470K			
R284	470K			
R285	100K			
R286	2700Ω 7W	PW7-2700	7W-SQ-2700	
R287	10Ω			
R288	3000Ω 10W 5%			
R289	2500Ω 10W	PW10-2500	10W-SQ-2500	
R290	47K 1W 5%			
R291	100Ω			
R292	100Ω			
R293	100K			

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Packard-Bell PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T8	117V @ 1.3A	650VCT @ .180A DC	5A @ 3A	89083B		P-8331 ①		R-42BC	①Drill new mounting hole(s).
	SEC. 3	SEC. 4	SEC. 5						
	6.3V @ 3.7A	6.3V @ 2.4A							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Packard-Bell PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T9	7200Ω CT	6-8Ω	89460 ①	A-3021	A-3870	22S58	S-55X	①Alternate Part #89532B.
T10	7200Ω CT	6-8Ω	89460 ①	A-3021	A-3870	22S58	S-55X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Packard-Bell PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP2	10"	PM	6-8Ω	83711D ①	10A6PA	① Used in Model 21CK1.
SP3	4"	PM	6-8Ω	83110B ①	4A15Z8	② Two used in Models 21CC3, 21CC3A.
SP4	4"	PM	6-8Ω	83111B ①	4A15Z8	
SP5	10"	PM	6-8Ω	83711D ①	10A6PA	
SP6	4"	PM	6-8Ω	83110B ①	4A15Z8	
SP7	4"	PM	6-8Ω	83111B ①	4A15Z8	
	6" x 9"	PM	6-8Ω	83113 ②	69A1Z8	

VHF TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC — USE	GENERAL ELECTRIC — TYPE	RAYTHEON — ITEM No.	RAYTHEON — USE	SYLVANIA — TYPE
V301	R.F Amp.	6EH5/6Q	V302	Mixer - Osc.	6CG8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C301	27 N750 10%		NT5D-27	TCH-27	C10QSTU	CCTH-270	CNT-427	10TCU-Q27
C302	27 N750 10%		NT5D-27	TCH-27	C10QSTU	CCTH-270	CNT-427	10TCU-Q27
C303	27 N750 10%		NT5D-27	TCH-27	C10QSTU	CCTH-270	CNT-427	10TCU-Q27
C304	27 N750 10%		NT5D-27	TCH-27	C10QSTU	CCTH-270	CNT-427	10TCU-Q27
C305	30							
C306	36		NPO-DI 25	TCH-27	C10QSTC	CCTO-270	CNO-427	10TCC-Q27
C307	1000		RF-001	MFT-1000		CCF-102	CT280A	
C308	1.8-7			828-7				
C309	100		RF-000L	MFT-100				
C310	.5-3			828-5		CV-1	CT505	
C311	36		NPO-25	TCH-27	C10QSTU	CCTO-270	CNO-427	10TCC-Q27
C312	33		NPO-DI 33	DTZ-33	C10QS3C	CCTO-330	CNO-433	10TCC-Q33
C313	.5 10%		NPO-SL.5	TCE-R5				
C314	.5-3			828-3		CV-1	CT505	
C315	39 N750 5%			TCH-39	C10QS9U	CCH-390	CNT-439	10TCU-Q39
C316	2 N1500 5%							

FIXED CAPACITORS (cont)

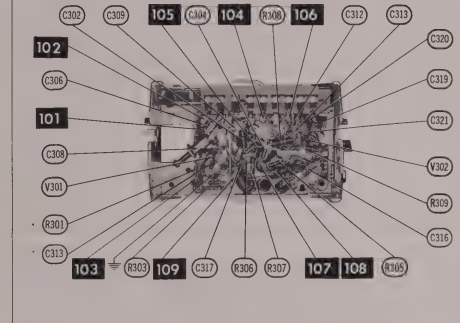
ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C317	27 N750 5%		NT5D-27	TCH-27	C10QSTU	CCTH-270	CNT-427	10TCU-Q27
C318	4.7 NPO		NPO-DI 4.7	DTZ-4R7	C10Q47C	CCTO-4R7	CNO-547	10TCC-V47
C319	5.6 NPO		NPO-DI 5.6	DTZ-5R6	C10Q56C	CCTO-5R6	CNO-433	10TCC-V33
C320	3 NPO		NPO-DI 3.0	DTZ-3R3	C10Q3C	CCTO-3R3	CNO-433	10TCC-V33
C321	6.2 N750 10%				C10V62U			
C322	1000		RF-001	MFT-1000		CCF-102	CT280A	
C323	1000		RF-001	MFT-1000		CCF-102	CT280A	
C324	1000		RF-001	MFT-1000		CCF-102	CT280A	
C325	1000		RF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R301	47K			
R302	100Ω			
R303	47Ω			
R304	270Ω			
R305	220K			
R306	100Ω			
R307	22K			
R308	12K			
R309	10K			



A Howard W. Sams CIRCUITRACE Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

BOTTOM VIEW

PRE-ALIGNMENT INSTRUCTIONS

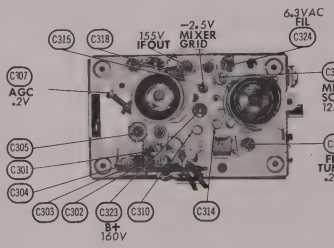
Suggested Alignment Tools: GENERAL CEMENT #5009, 8195, 8274; 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

VHF OSCILLATOR ALIGNMENT

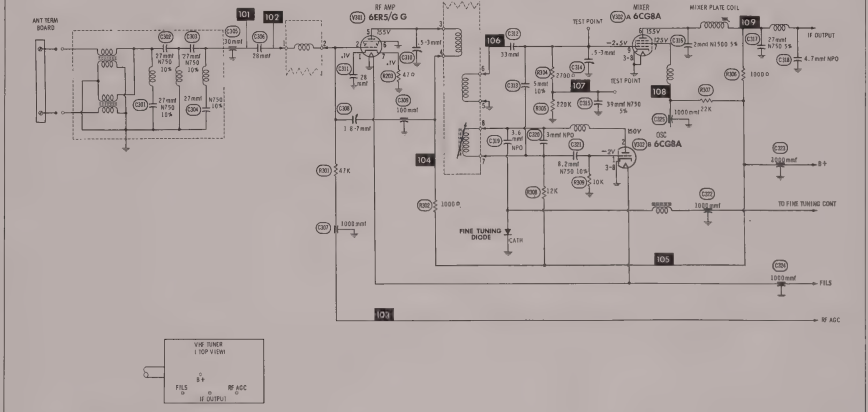
The individual channel adjustment screws are accessible one at a time thru a hole in the rear of the tuner, as the Channel Selector is rotated. Set the Fine Tuning to the center of its range and switch to the channel to be adjusted. Adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.



TOP VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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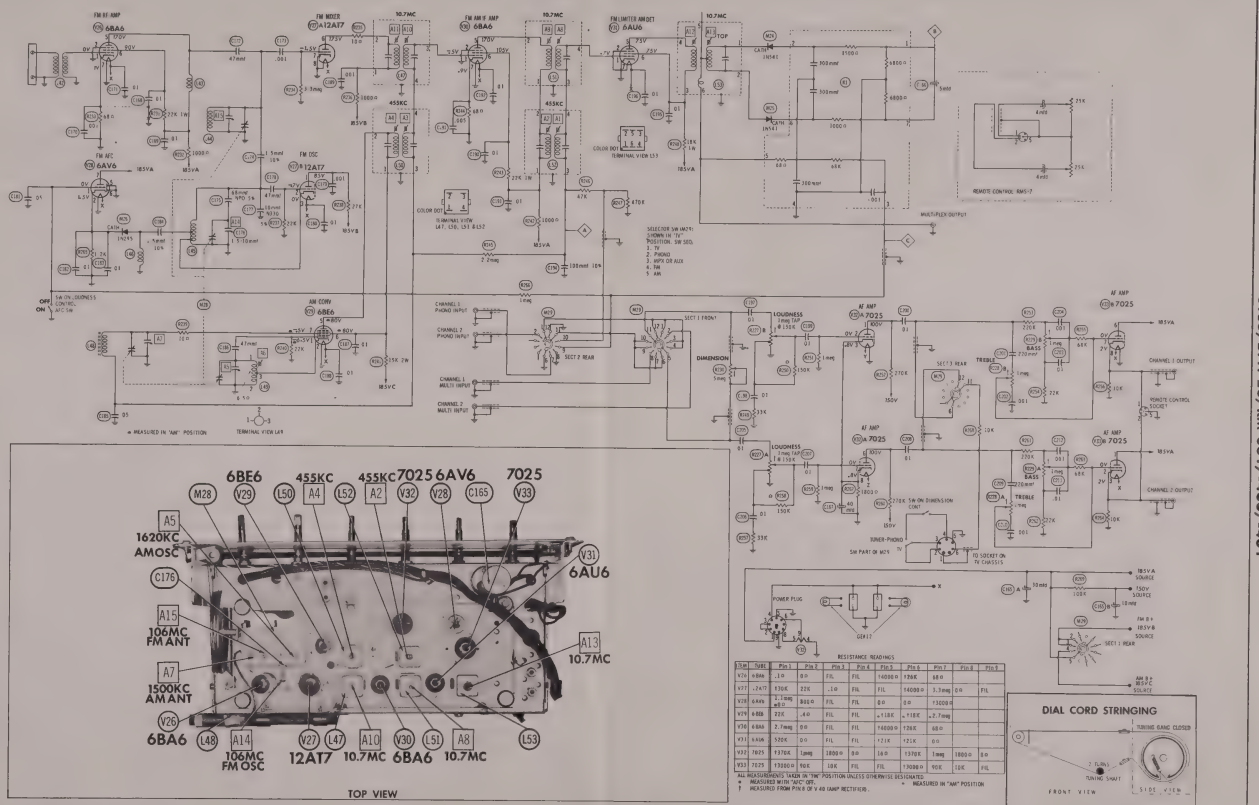
VHF TUNER 106518

PACKARD-BELL CHASSIS 98C2, 98C4, 81U5, DPA-20, RM-301, -400, -401



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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FM-AM TUNER 8TU5, REMOTE CONTROL BALANCE CHASSIS RMS-2

FM-AM ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Loudness control pulled out to defeat AFC Circuit.
Suggested Alignment Tools: A1 thru A4 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A5, A7, A14, A15 .. GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6, A12, A13 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A8 thru A11 ..... GENERAL CEMENT #8721, 8722
WALSCO #2519

AM ALIGNMENT - SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	AM Tuning gang fully open	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	530KC	Tuning gang fully closed	"	A6	Adjust for maximum deflection. Repeat steps 2 and 3.
4.	"	1500KC	1500KC Signal	"	A7	Adjust for maximum deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM - SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru .01mfd to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	FM Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A8, A9, A10, A11	Adjust for maximum deflection.
6.	"	"	"	DC probe to point Ⓑ. Common to chassis.	A12	"
7.	"	"	"	DC probe to point Ⓒ. Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE - SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side thru .01mfd to pin 7 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp.)	FM Point of non-interference	Vert. Amp. to point Ⓐ. Low side to chassis.	A8, A9, A10, A11	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A12	"
7.	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A13	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT - SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Across FM antenna terminals with 150Ω in each lead.	106MC (Unmod.)	FM 106MC	DC probe to point Ⓐ. Common to chassis.	A14, A15	Adjust for maximum deflection.
9.	"	92MC	92MC	"	L44, L45	Adjust for maximum deflection by expanding or compressing coil turns. Repeat steps 8 and 9.

FIG. 1

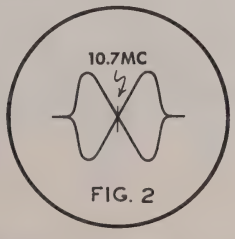
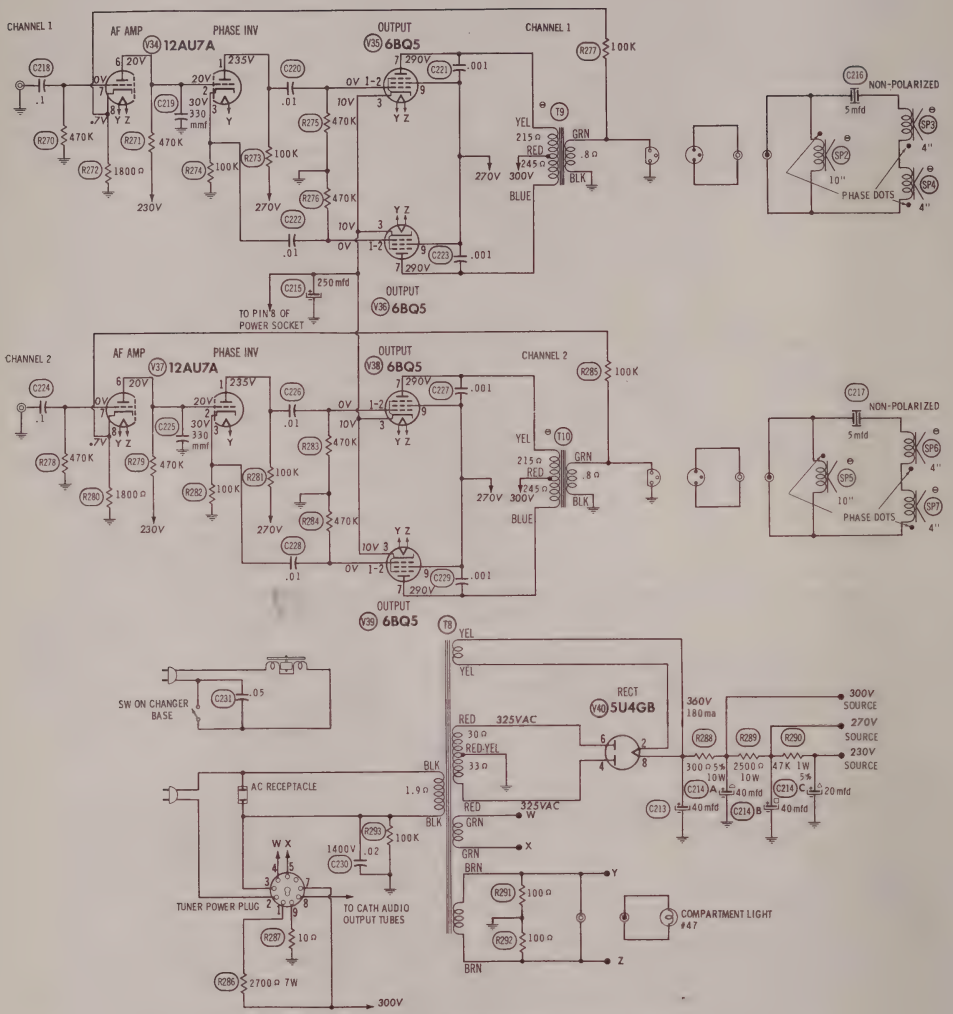


FIG. 2



RESISTANCE READINGS

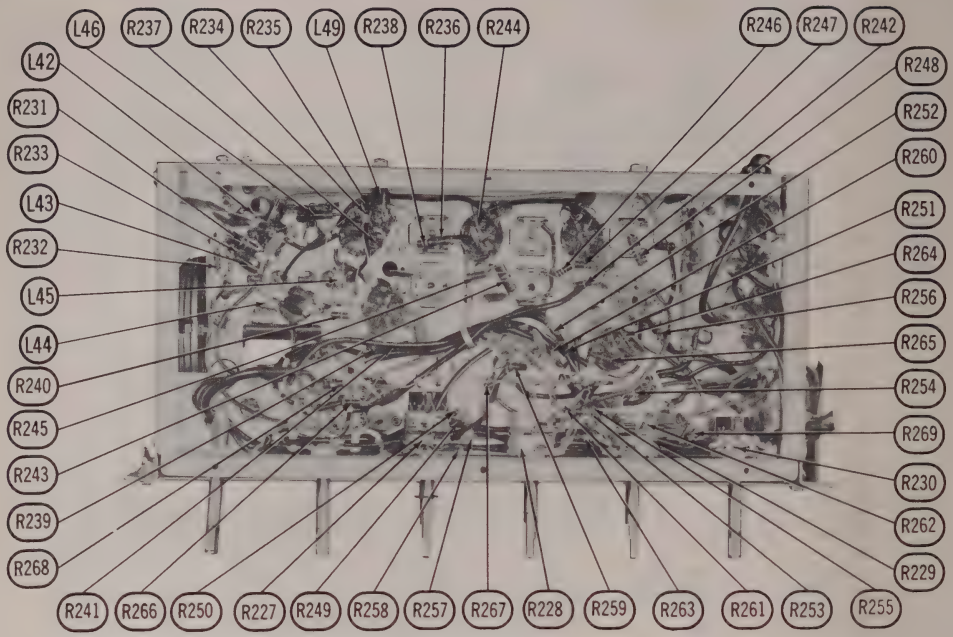
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V34	12AU7A	†100K	†520K	100K	FIL	FIL	†520K	470K	1800Ω	FIL
V35	6BQ5	NC	470K	16Ω	FIL	FIL	NC	†515Ω	NC	†2800Ω
V36	6BQ5	NC	470K	16Ω	FIL	FIL	NC	†545Ω	NC	†2800Ω
V37	12AU7A	†100K	†520K	100K	FIL	FIL	†520K	470K	1800Ω	FIL
V38	6BQ5	NC	470K	16Ω	FIL	FIL	NC	†515Ω	NC	†2800Ω
V39	6BQ5	NC	470K	16Ω	FIL	FIL	NC	†545Ω	NC	†2800Ω
V40	5U4GB	NC	¶	NC	33Ω	NC	30Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V40. NC NO CONNECTION.

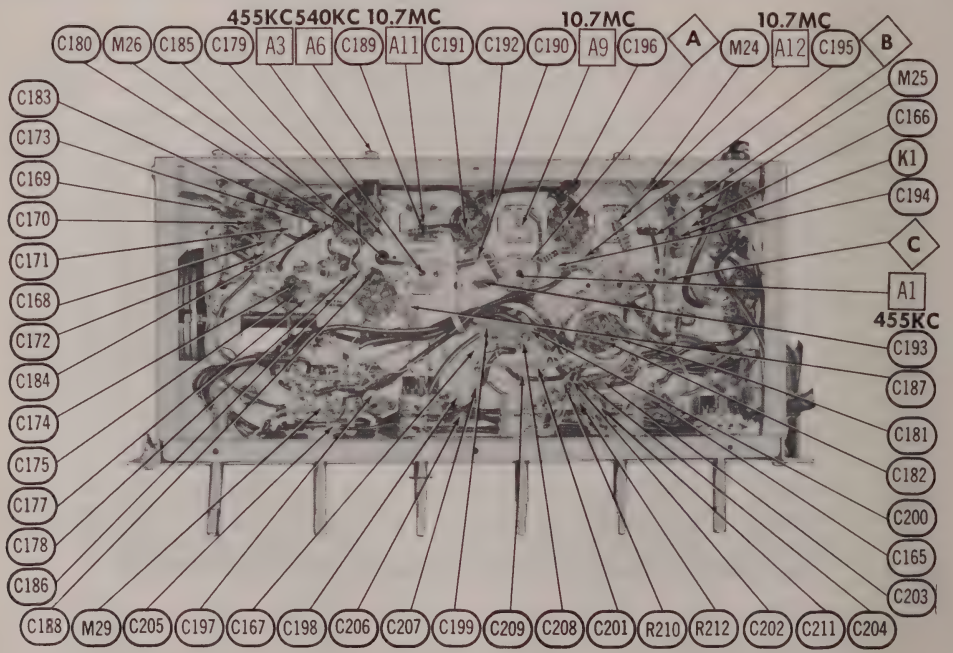
AMP. CHASSIS DPA-20

AMP. CHASSIS - TOP VIEW

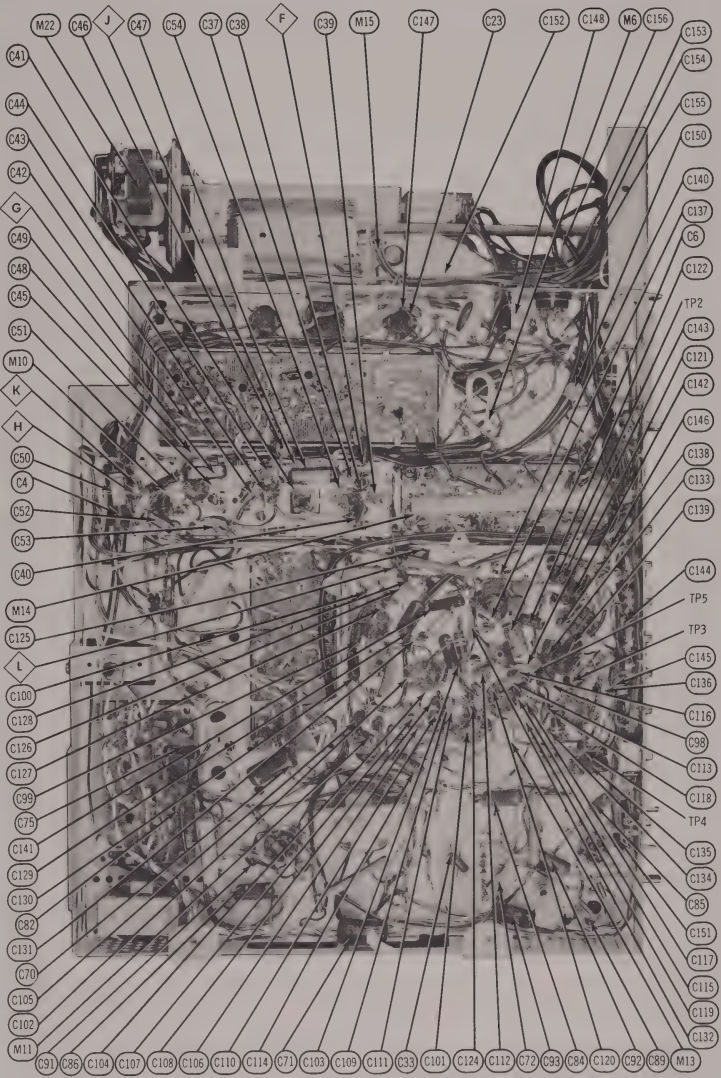
AMP. CHASSIS - BOTTOM VIEW



FM-AM TUNER 8TU5 BOTTOM VIEW - RESISTOR, INDUCTOR IDENT.



FM-AM TUNER 8TU5 BOTTOM VIEW - ALIGN., CAPACITOR, MISC. IDENT.

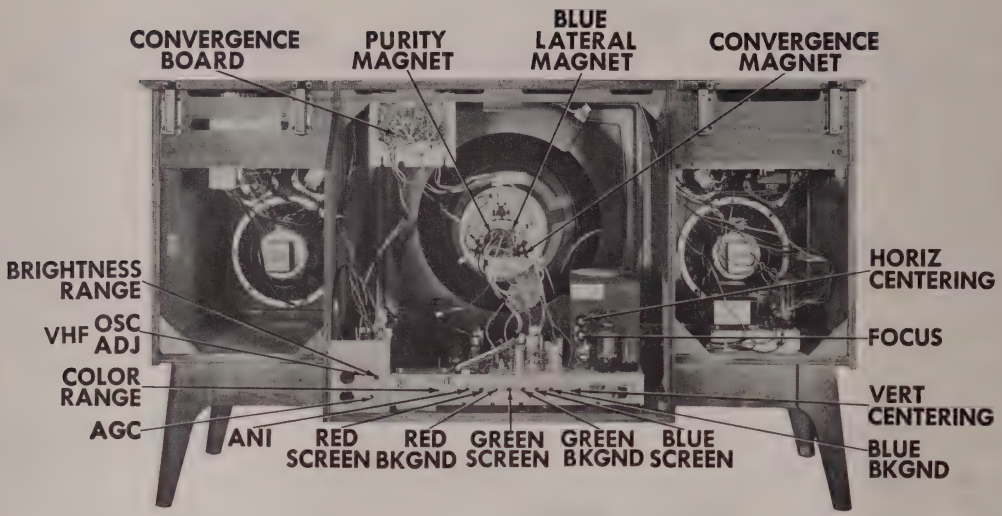


TP2 200V RED GUN GRID TP4 195V GREEN GUN GRID
TP3 215V BLUE GUN GRID TP5 .9V CHROMA REF OSC CONTROL GRID

TV CHASSIS BOTTOM VIEW - ALIGN., CAPACITOR, MISC., TEST POINT IDENT.

PACKARD-BELL CHASSIS 98C3, 98C4,
81T5, DPA-20, RM-301, -400, -401

FOLDER 1



CABINET—REAR VIEW

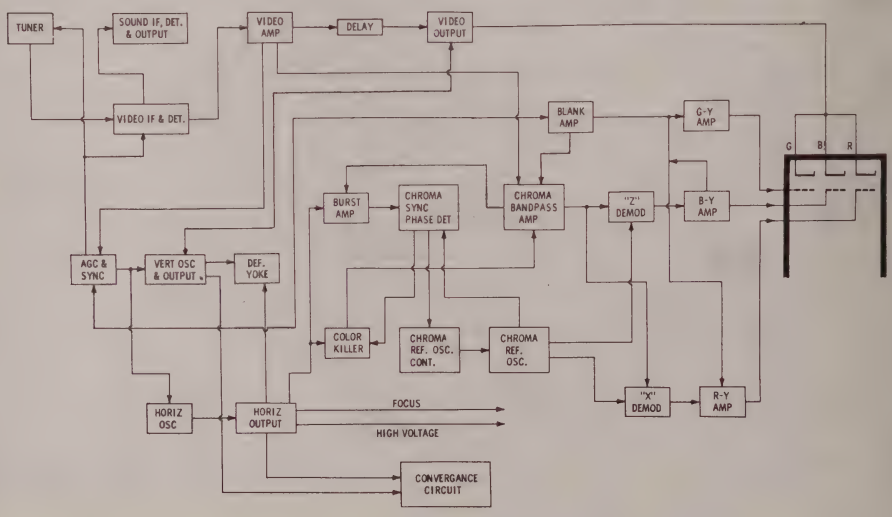
DISASSEMBLY INSTRUCTIONS

TV CHASSIS REMOVAL - MODEL 21CK1

1. Disconnect antenna leads.
2. Remove 8 wood screws holding rear cover.
3. Remove remote control plugs.
4. Remove 3 knobs at front of cabinet.
5. Remove FM-AM Tuner plug from TV chassis.
6. Remove Power Amp. AC plug from TV chassis.
7. Disconnect high voltage lead, picture tube socket, and yoke leads.
8. Remove 4 TV chassis bolts, and 1 screw at left side of TV chassis.
9. Remove 2 screws holding control panel.
10. Pull TV chassis out far enough to disconnect conversion board plug (at TV chassis, left side).

PICTURE TUBE REMOVAL

It is necessary to remove TV chassis for picture tube removal.



BLOCK DIAGRAM

PHOTOFACT® Folder

**TRUETONE MODELS
2DC1136, 2DC1138**

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

TRUETONE MODELS
2DC1136, 2DC1138

MODEL 2DC1138A

TRUETONE MODELS
2DC1136, 2DC1138

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

MODEL 2DC1138A

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Truetone, Models 2DC1136A, 2DC1138A
SUPPLIER	Western Auto Supply Co., 2107 Grande Avenue, Kansas City 8, Mo.
TYPE SET	Television Receiver
TUBES	VHF - Fourteen, UHF - Fifteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING VHF - 140 Watts, 1.3 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 5 screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE DEVICE

A 7.5Ω fusible resistor is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENT

To touch up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

The AGC may be varied by means of a Range control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive trimmer. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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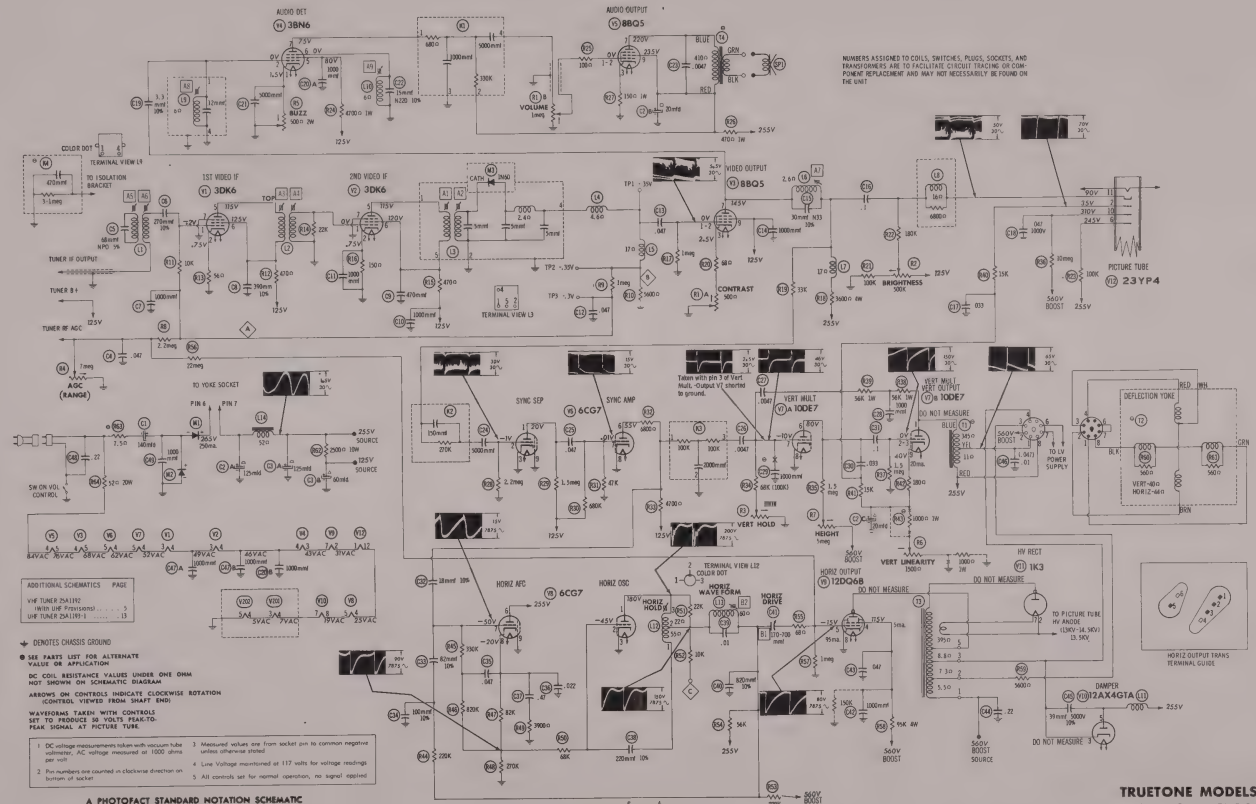
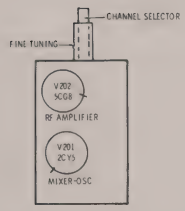
TRUETONE MODELS
2DC1136, 2DC1138

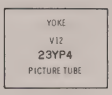
SET 546 FOLDER 2

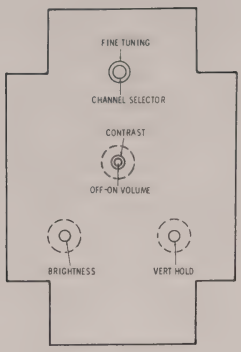


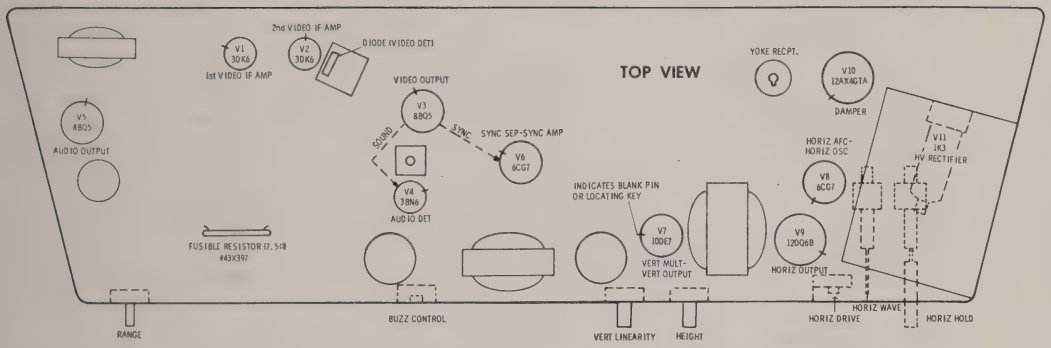
TRUETONE MODELS
2DC1136, 2DC1138

TUBE PLACEMENT CHART









TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

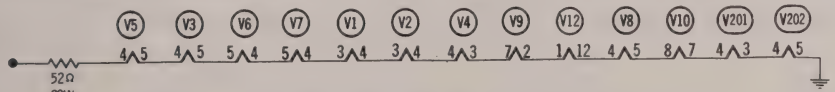
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor, Rectifiers (B+)

SWEEP FAILURE
No raster, has sound V8, V9, V10, V11, V12
No vertical deflection V7
Poor vert. linearity or foldover V7
Poor horiz. linearity or foldover V8, V9, V10
Narrow picture V9, V10, Rectifiers (B+)
Vert. off freq. V7
Horiz. off freq. V8

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3
Has pic, no sound V4, V5

SYNC FAILURE
No vert. sync V6
No horiz. sync V6
No vert. or horiz. sync V6

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 7 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01mfd	High side to pin 1 (grid) of 2nd Video IF. Low side to chassis. Adjust output for 4VP-P on scope.	44.0MC (10MC Swp)	42.4MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 47K to point (B). Low side to chassis. (Across Video Det. load)	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. A1 controls marker position and A2 controls gain and symmetry.
2.	"	High side to pin 1 (grid) of 1st Video IF. Low side to chassis. Adjust for 4VP-P on scope.	"	42.4MC 43.5MC 44.5MC 45.75MC	"	"	A3, A4	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. A3 controls marker position and A4 controls gain and symmetry.
3.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	41.25MC 42.4MC 43.5MC 44.5MC 45.75MC	"	"	A5, A6, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. Adjust A5 to place 41.25MC marker in trap notch.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.01mfd	High side to pin 2 (grid) of Video Output. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	AC probe to pin 11 (cathode) of picture tube. Common to chassis. Use 0-10V AC scale.	A7	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV station and reduce the signal strength at the antenna terminals until a hiss is heard in the sound similar to super-regeneration.
Adjust A8, A9 and the Buzz control for maximum undistorted sound with MINIMUM buzz.
If the hiss disappears during adjusting, further reduce the signal strength.

FIG.1

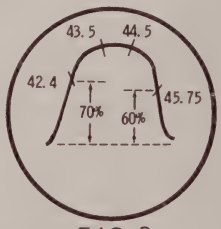
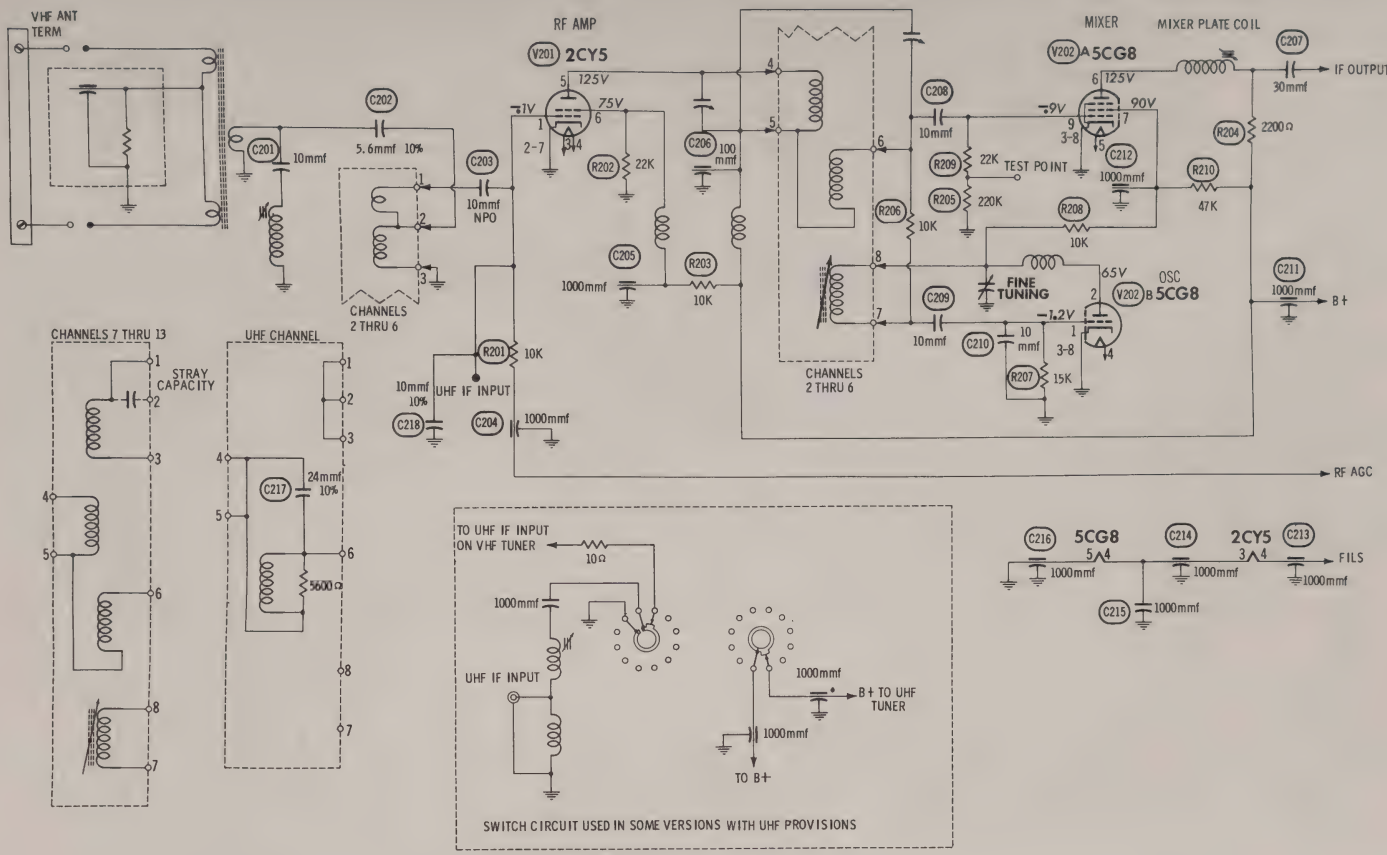


FIG. 2

FIG. 3



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER with UHF Provisions - 25A1192

TRUETONE MODELS
2DC1136, 2DC1138

TUNER PARTS LIST AND DESCRIPTIONS

25A1192

TUBES

ITEM No.	USE	TYPE (• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)
V201	RF Amp.	2CY5
V202	Mixer - Osc.	5CG8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C202	5.6 10%							10TCC-V5.6
C203	10 NPO		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C204	1000		EF-001	MFT-1000		CCF-102	CT280A	
C205	1000		EF-001	MFT-1000		CCF-102	CT280A	
C206	100		EF-0001	MFT-100				
C207	30							
C208	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C209	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C210	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C211	1000		EF-001	MFT-1000		CCF-102	CT280A	
C212	1000		EF-001	MFT-1000		CCF-102	CT280A	
C213	1000		EF-001	MFT-1000		CCF-102	CT280A	
C214	1000		EF-001	MFT-1000		CCF-102	CT280A	
C215	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	
C217	24 10%		NPO-SI 24	TCZ-24	C10Q24C	CCTO-240	CNO-427	10TCC-Q25
C218	10 10%		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R201	10K				R206	10K			
R202	22K				R207	15K			
R203	10K				R208	10K			
R204	2200Ω				R209	22K			
R205	220K				R210	47K			

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA
K201	VHF Antenna Filter			

TUNER ALIGNMENT INSTRUCTIONS

TUNER ALIGNMENT

Suggested Alignment Tools: GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

VHF OSCILLATOR ALIGNMENT

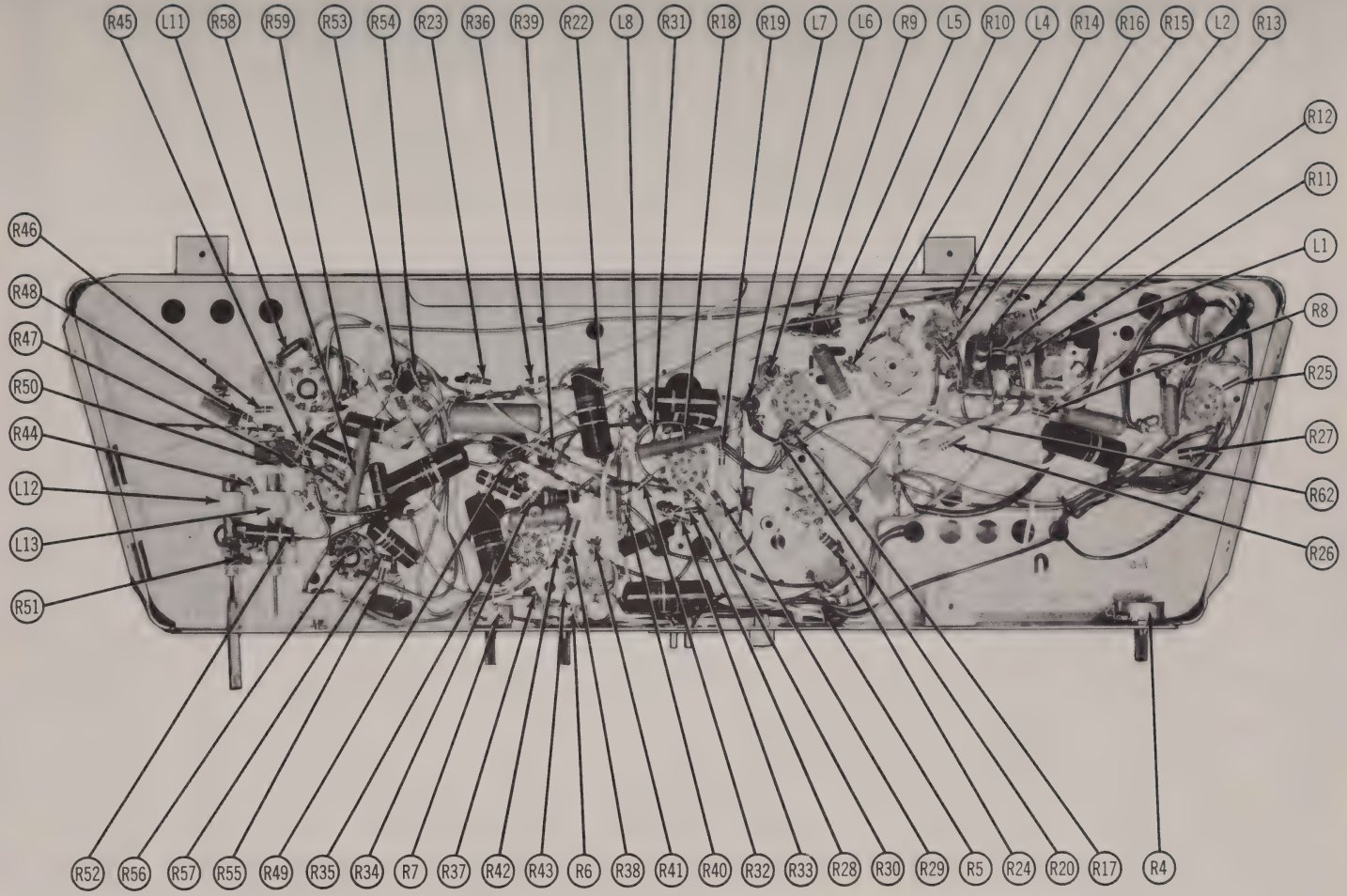
The individual channel adjustment screws are accessible one at a time, thru a hole in the front of the tuner, as the Channel Selector is rotated. Set the Fine Tuning to the center of its range and switch to channel to be adjusted and adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

UHF TUNER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC * TYPE	RAYTHEON * TYPE	SYLVANIA * TYPE
V1	1st Video IF Amp. 3DK8	V7 Vert. Mult. - Vert. Output 10DE7	
V2	2nd Video IF Amp 3DK8	V8 Horiz. AFC - Horiz. Osc. 6CU7	
V3	Video Output 6BQ8	V9 Horiz. Output 12BQ6B	
V4	Audio Det 3BN6	V10 Damper 12AX4GTA	
V5	Audio Output 6BQ8	V11 HV Rectifier 1B3GT	
V6	Sync Sep. - Sync Amp. 6CU7		

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: TRUETONE PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V12	23VP4		23VP4 ①		23VP4 ②	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT.	REPLACEMENT DATA: TRUETONE PART No.	ALLOVOX CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	140	150	4SX421	AF18E-33	ZA0261	F7517	TVL-1438	
C2A	▶135	300	4SX421	AF24-03-60	XC0733.3	F7533.15	TVQ-4046	TVL-3674.9*
B	▶30	300						
C	▶80	50						
C3A	▶135	300	4SX407	AF18S-00-83	C0046	F7536.75	TMT-3310	TVL -3674.8
B	▶80	300						

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic CapacitPors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: ALLOVOX PART No.	CORNELL DUBILIER PART No.	CENTRALAB PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.047	300V		P2S8N-047	DD-503	CUS8247	4DP-3-473	GEM-6147	2TM-S47
C5	50	MPO	10%		DD-501	CUS8251	CCTD-500	CNC-468	10TCC-S68
C6	270		10%		DD-271	LU2727	CCD-271	GP327	10TS-Y27
C7	500				BZP2-001	BYA201X	CCD-501	B-210	5HX-D50
C8	390				DS-391	DD-391	LU2739	CCD-391	B-339	10TS-Y39
C9	470		10%		DS-471	DD-471	5S8747	CCD-471	GP347	10TS-Y47
C10	1000				BZP2-001	BYA201X	CCD-102	B-210	5HX-D50
C11	1000				DS-1010	DD-101	PM6IX	CCD-102	B-210	10TS-D10
C12	.047	300V		P2S8N-047	DD-503	CUS8247	4DP-3-473	GEM-6147	2TM-S47
C13	.047	300V		P2S8N-047	DD-503	CUS8247	4DP-3-473	GEM-6147	2TM-S47
C14	1000			BZP2-001	DD-103	BYA201X	CCD-102	B-210	5HX-D50
C15	30						CCD-300	B-310	5HX-D30
C16	.1	400V		P4S8N-1	DF-104	CUS8421	4DP-3-104	GEM-6101	4TM-P10
C17	.033	200V	10%	78AC2S2-1P5		P4S8X33	4DP-2-333	GEM-1813	4TM-S33
C18	.047	400V		P10S8N-047		CUS8247	1SDP-5-473	GEM-6147	10TM-S47
C19	3000		10%	BZP2-3E.5	TCS-1593	C5V3XC	CCD-302	CNC-493	10TCC-V33
C20A	1000						CCD-102	B-210	5HX-D50
B	1000			BZP2-1K0X	DD8-103	BYD601X	CCD-102	B3X210	5HX-X50
C21	1000			BZP2-005	FF-503	BYA202X	CCD-502	B-350	5HX-D50
C22	15								
C23	.1	1200	10%	P6S8N-0047	DS-472	CUS8247	5DP-1-473	GEM-6147	5TM-D47
C24	.0047	600V		BZP2-005	DD-503	BYA202X	4DP-3-473	B-350	5HX-D50
C25	5000			P4S8N-047	DD-503	CUS8247	4DP-3-473	GEM-6147	4TM-S47
C26	.047	400V		P4S8N-047	DS-473	CUS8247	4DP-1-473	GEM-6147	4TM-S47
C27	.0047	400V			P3S8C6D47-1P5		P3S8D47	5DP-1-473	GEM-16247	5TM-D47
C28	.0047	600V	10%		BZP2-001	DD-103	BYA201X	CCD-102	B-210	5HX-D50
C29	1000				BZP2-001	DD-103	BYA201X	CCD-102	B-210	5HX-D50
C30	1000				P3S8N-033	DD-303	CUS8253	4DP-3-333	GEM-6133	4TM-S33
C31	.033	600V			P6S8N-1	DF-104	CUS8251	5DP-4-104	GEM-501	5TM-P10
C32	10		10%		P3S8N-000518	TCS-418	2S8X23	4DP-1B-150X	CNC-418	M5-418
C33	15		10%		P3S8N-000543	TCS-E3	2S8X243	CM-19B-X5KH	CNC-482	M5-482
C34	100		10%		P3S8N-000547	TCS-E3	2S8X247	CM-19B-101K	MC2E3	M5-E3
C35	100		10%		1689-00052	TCS-250	XS8X253	4DP-3-473	GEM-6147	2TM-S47
C36	.047	300V			P2S8N-047	DD-503	CUS8247	4DP-3-473	GEM-6147	2TM-S47
C37	.047	300V			P2S8N-047	DD-503	CUS8247	4DP-3-473	GEM-6147	2TM-S47
C38	220		10%	4TA276	P2S8N-221		CM-19B-221K	MC2E1	M5-E1	
C42	1000				BZP2-001	DD-103	BYA201X	CCD-102	B-210	5HX-D50
C43	.047	400V			P4S8N-047	DD-503	CUS8247	4DP-3-473	GEM-6147	4TM-S47
C44	.22	400V			P4S8N-22		CUS8423	4DP-5-224	GEM-6223	4TM-P23
C45	.22	200V	10%						6TC-4151	
C46	.01	400V		(.047) †	P4S8N-01	DS-103	CUS8251	4DP-1-103	GEM-601	4TM-S	
C47A	1000				BZP2-1X001	DD2-103	BYD601X	CCD-102	B3X210	5HX-X50
B	1000							CCD-202	B-310	
C48	.33	400V			P4S8N-33		CUS8423	4DP-5-334	GEM-6123	5TM-P33
C49	10000	1400V		Note 1	DAC-37	DD8-103	HV8186	5SDP-3-103	UAC-110	B1-E0
									110-600	P7L-600

Note 1. May not be used in some versions. † Alternate Value. ▲ Trentone Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESIST ANCE	WATTS	REPLACEMENT DATA: TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS - IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5000		78X27	F1-1				Contrast
B	long	‡		R3-51	RTV-710			Volume
C	Switch	‡		S3-1				Power Off-On
R2A	500K	‡	403423	B-5S	A47-500K-S	Q31-153	U50	Brightness
B	Shaft			F3-3		Not Req.	Not Req.	
R3A	200K	‡	403484	B-4S	A47-200K-S	Q31-129	U43	Vert. Hold
B	Shaft			Not Rec	F3-3	Not Req.	Not Req.	
R4	5meg	‡	403483					Range (AGC)
R5	5000	2(4W)	403472			110-600	P7L-600	Buss

PARTS LIST AND DESCRIPTIONS (cont)

CONTROLS (cont)

ITEM No.	RATING: RESIST ANCE	WATTS	REPLACEMENT DATA: TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS - IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R8A	1500Ω	‡	403464-3		TT-311	B4T-1500-S	M1-109	Vert. Linearity
B	Shaft				Not Req.	Not Req.	TM-4	
R7A	5meg	‡	403491					Height
B	Shaft							

▪ "ITA-LOC" Equivalent: FC5SL, RU16L, OS869T, 1E2255, U.S41.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R6	2 Meg			
R9	1meg			
R10	5800Ω			
R11	50Ω			
R12	470Ω			
R13	56Ω			
R14	22K			
R15	470Ω			
R16	150Ω			
R17	1meg			
R18	3600Ω 4W	FW5-3600Ω	4W-8Q-3600Ω	84X33H
R19	33K			
R20	68Ω			
R21	180K			
R22	180K			
R23	100K			
R24	4700Ω 1W			
R25	100Ω			
R26	470Ω 1W			
R27	1500 1W			
R28	2.5meg			
R29	1.5meg			
R30	680K			
R31	47K			
R32	6800Ω			
R33	4700Ω			
R34	68K			
R35	1.5meg			
R36	10meg			100K ①

① Alternate Value.
③ May not be used in some versions.

ITEM No.	RATING	REPLACEMENT DATA: IRC PART No.	WORKMAN TV PART No.	REMARKS
R37	1.5meg			
R38	56K 1W			
R39	56K 1W			
R40	18K			
R41	18K			
R42	150Ω			
R43	1000Ω 1W ②			
R44	220K			
R45	330K			
R46	82K			
R47	82K			
R48	120K			
R49	3900Ω			
R50	56K			
R51	22K			
R52	10K			
R53	220K			
R54	56K			
R55	56Ω			
R56	22meg			
R57	1meg			
R58	91K 4W	FW5-9500Ω	5W-8Q-9500Ω	84X35H
R59	5800Ω			
R60	9600			
R61	9600			
R62	9600Ω 10W	FW10-3500Ω	5W-8Q-3500Ω	84X329H
R63	7.5Ω ③			84X329T
R64	5Ω 20W			84X330T

② Alternate Value.
▲ Trentone Part Number

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No.	REPLACEMENT DATA
K1	Volume Comp.	1000mmf, 8000mmf, 6800Ω, 220K	76X28	Centralab PC-406
K2	Sync Sep. Grid	150mmf, 470K	76X29	Sprague FSC-5
K3	Vert. Integrator	2000mmf, 100K, 100K	76X19	
K4	Isolation	4700mmf, 3-5meg	*	Centralab RC-471 Sprague AC1-1

* Some versions may use 1000mmf (3000V), 220K - 1meg Component Combination (Part #76X24 in this distributor).

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	Merit PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1A	1st Video IF	9A2438			T301	
B	1st 25MC Trap				T301	
L2	2nd Video IF	9A2444			T316	
L3A	3rd Video IF	9A2439			T249	
B	RF Choke (20uh)		TV-180	8178	RTC-4593	T301
L4	RF Choke (30uh)	9A2375	TV-160	8176	RTC-4593	T301 *
L5	Peaking (290uh)	36A22	TV-165	8155	RTC-3587	T247
L6	4.5MC Trap	9A2366	TV-151	1459	RTC-4602	T251
L7	Peaking (125uh)	36A27	TV-200	8132	RTC-3577	T256
L8	Peaking (270uh)	36A45 ①	TV-198 *	8160 *	RTC-4576 *	
L9	Sound Takeoff Coil	9A2434	TV-154	1470-A	RTC-4604	
L10	Quadrature Coil	9A2367	TV-132	1450	RTC-4605	
L11	RF Choke (1.5uh)	9A2380	BC-562	6804	RTC-4606	

① Enlarge mounting hole.

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.	NOTES
L13	Horiz. Osc.	9A2491							
L13	Horiz. Waveform	9A2372	MWC-12	6315	WC-18	SB-5 ①	WLC-3	T110	

① Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT	REPLACEMENT DATA: TRUETONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L14	.250A	52Ω	8 Hy.	52X96-11	C-3996 ①	C-3343	26C64	C-35X	① Drill new mounting hole.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	Workman TV PART No.	NOTES
T1	Vert. Output	51X207-1A	A-3855	VO-108	26S73 ①	A-14ZX ③		
T2	Yoke (Horiz. 24MS)	9A-2492	MDF-125	DY1-31A	③ ④	Y-45 ③	Y-45 ③ &	
	(90°) (Vert. 40MS)			DY1-90A				
	Yoke Clamp	30X511						
T3	Horiz. Output	52X349	RVO-174					

① Drill new mounting hole(s).
② Cut and tape red/black lead.
③ Remove jumper from across yoke plug pins #1 & #5, connect across pins #6 & #7. Remove jumper from yoke terminals #1 & #4.
④ Connect yoke #3 to plug pin #4; yoke #7 & #2 to plug pin #3; yoke #6 to plug pin #2; yoke #4 to plug pin #6; yoke #5 to plug pin #5.

⑤ Remove jumper from across yoke plug pins #7 & #8 and from across yoke terminals #3 & #5. Connect yoke #1 to plug pin #4; yoke #2 & #7 to yoke plug pin #3; yoke #3 to plug pin #2; yoke #4 to plug pin #5; yoke #5 to plug pin #6. Connect jumper across yoke plug pins #6 & #7.
⑥ Remove jumper across yoke plug pins #1 & #8. Connect across yoke plug pins #6 & #7.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	Vert. Output	51X207-1A	A-3855	VO-108	26S73 ①	A-14ZX ③	① Drill new mounting holes. ③ Cut and tape red/black lead.
T2	All. Vert. Output	52X371					
	Yoke	9A2492					
T3	Yoke Clamp	30X511					
	Horiz. Output	52X349					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: TRUETONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	6000Ω	3-4Ω	51X308A ①	A-3038	A-3977	24S81	S-6X	① Alternate Part #61X308.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V C IMP	REPLACEMENT DATA: TRUETONE PART No.	QUAM PART No.	NOTES
SPK	8"	PM	3-4Ω	12A537-1	SA07	Some Models use a 4" x 8" Speaker or a 2½" Speaker. Specify Model number when ordering replacement.

POWER RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: TRUETONE PART No.	RCA PART No.	CABLES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.250A	66X23	1N1764	F6	SR500	Silicon
M2	.250A	66X23	1N1764	F6	SR500	Silicon

SIGNAL DIODES

ITEM No.	CRYO. TYPE	REPLACEMENT DATA: TRUETONE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M3	1N80			1N80	1N80	Video Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M4	Tuner	21A102	VHF, STANDARD COIL REPLACEMENT Type #0G-432L/A
	Tuner	25A103-1	UHF
	Magnet	2A478	Bean Aligner

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

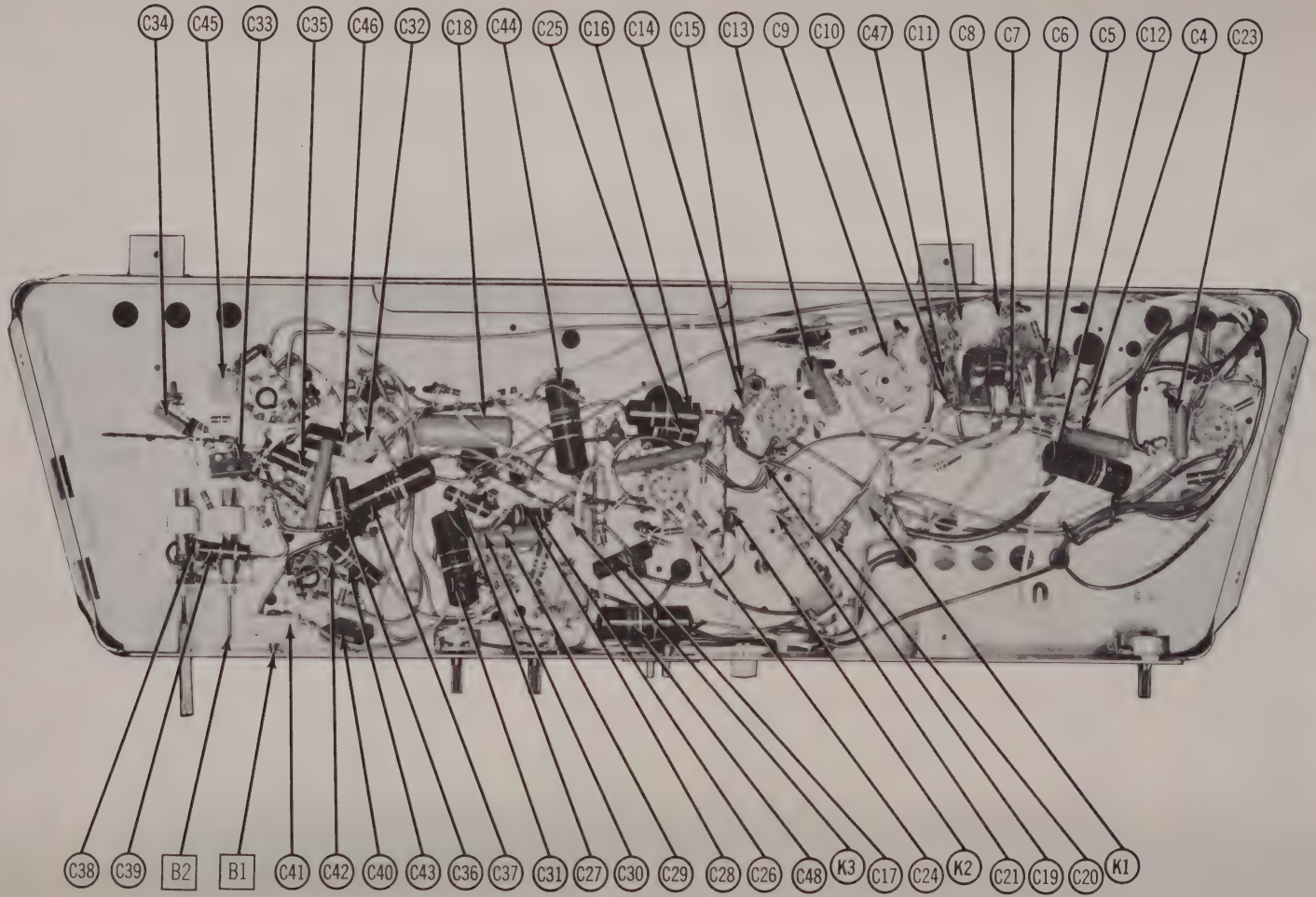
NAME	PART NO.	DESCRIPTION
Knob	10A1005-1	Channel Selector
Knob	10A1001-2	Fine Tuning
Knob	10A832-1	Contrast
Knob	10A832-1	Off-On, Volume
Knob	10A1006-1	Brightness, Vertical Hold
Knob	10A1018-1	Horiz. Hold
Knob	10A1018-3	Range Control
Knob	10A928-3	UHF Tuning
Knob	10A928-1	UHF Indicator

WIRING DATA

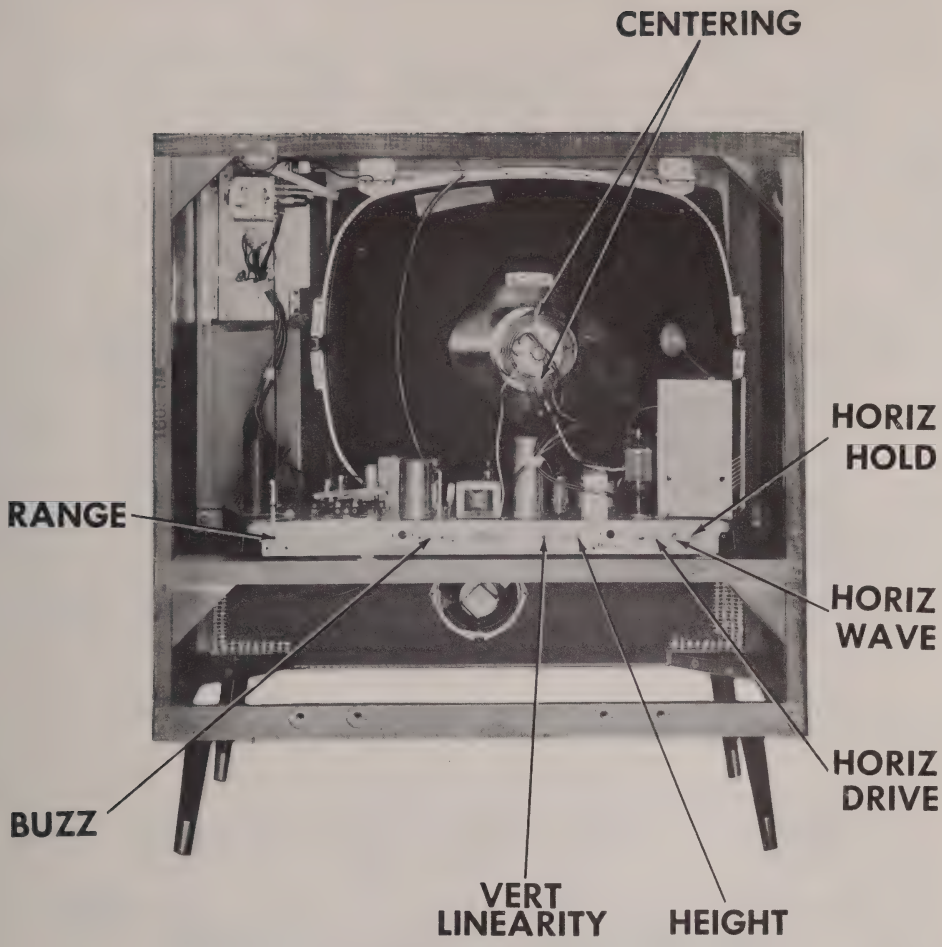
High Voltage Lead	Use BELDEN No. 8269
Shielded Hook-up Wire	Use BELDEN No. 8265 (Single Conductor) 9758 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8276
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8231
Antenna Rotor Cable	Use BELDEN No. 8484 (Flat) or 8484 (Round) - 4 Conductor 8486 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TRUETONE MODELS 2DC1136, 2DC1138

FOLDER 2



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune in a station and adjust the Horizontal Hold until the picture is just about to tear out of sync as can be seen at the top of the picture.

Turn the Contrast control fully counterclockwise and the Brightness control clockwise so that the picture appears washed out. Turn the Horzontal Drive trimmer (B1) clockwise until white bars (drive lines) appear in the left center portion of the raster, then counterclockwise until the white bars just disappear.

Connect the vertical amplifier of the scope to point Ⓒ. Low side to chassis. Adjust the Horizontal Waveform slug (B2) until the round and sharp peaks of the waveform are equal in amplitude. See Fig. 4. Keep the picture in sync during this adjustment.

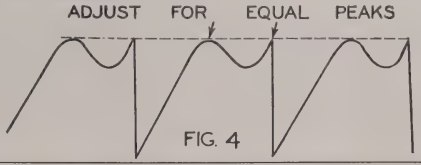


FIG. 4

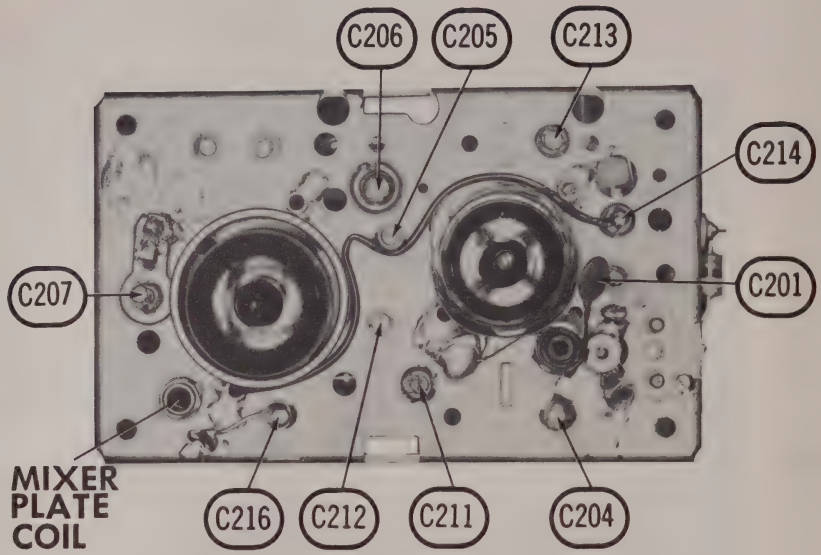
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

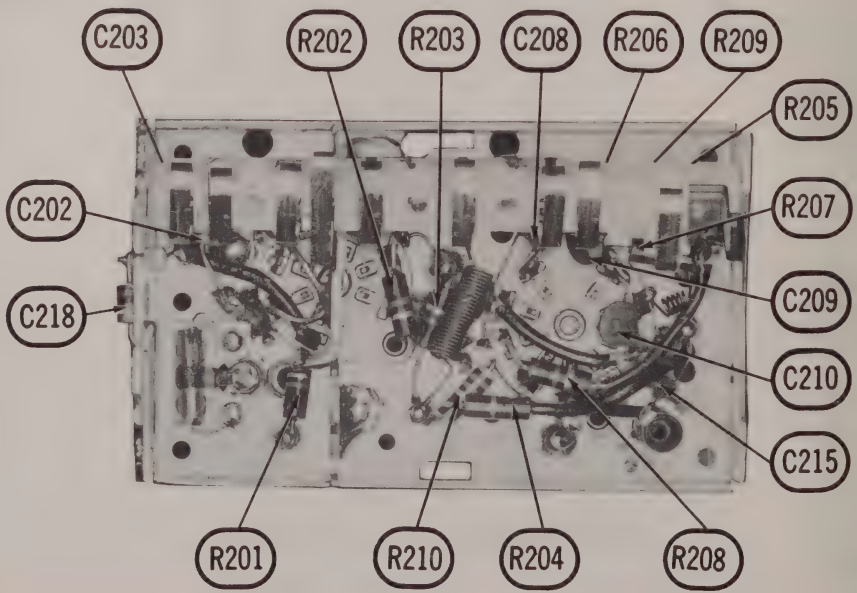
1. Remove 8 wood screws holding rear cover. Remove rear cover.
2. Remove 6 push-on type knobs on front of cabinet.
3. Remove 4 screws holding control panel in front (with tuner on panel).
4. Remove speaker leads, yoke plug, picture tube ground lead, and high voltage lead.
5. Remove 4 chassis bolts.
6. Remove chassis.

PICTURE TUBE REMOVAL

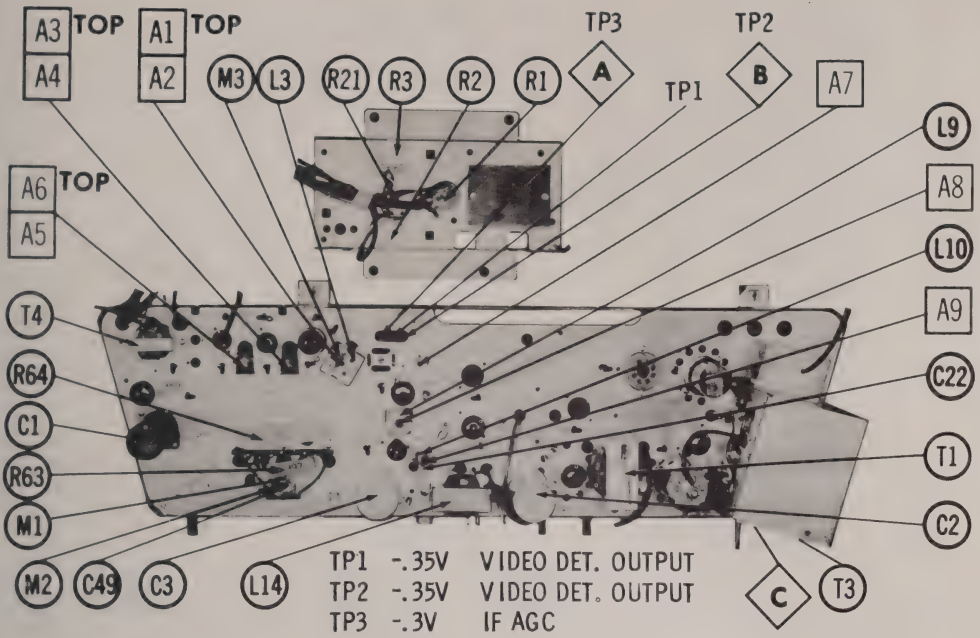
1. It is necessary to remove chassis for picture tube removal. (See "Chassis Removal".)



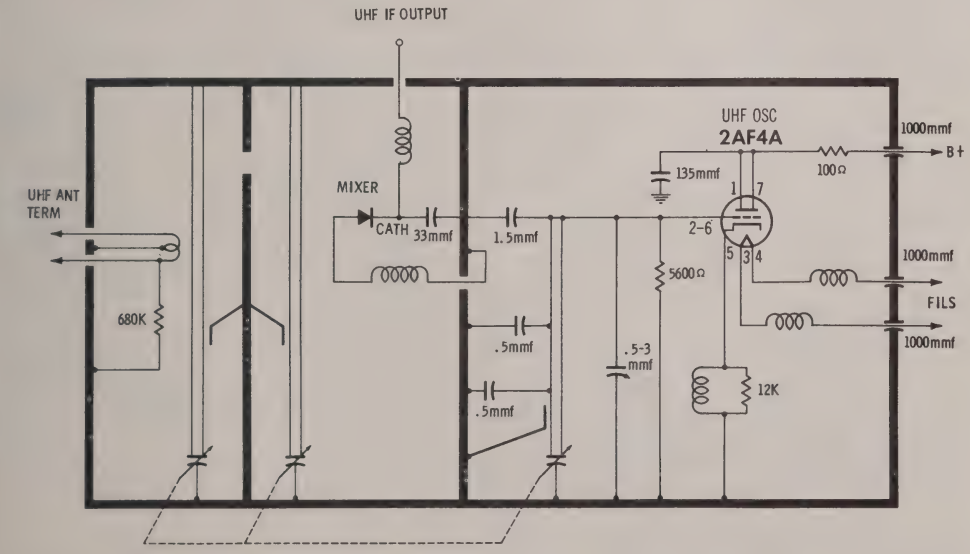
VHF TUNER with UHF Provisions 25A1192 - TOP VIEW



VHF TUNER with UHF Provisions 25A1192 - BOTTOM VIEW



CHASSIS - TOP VIEW



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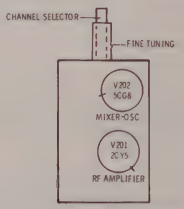
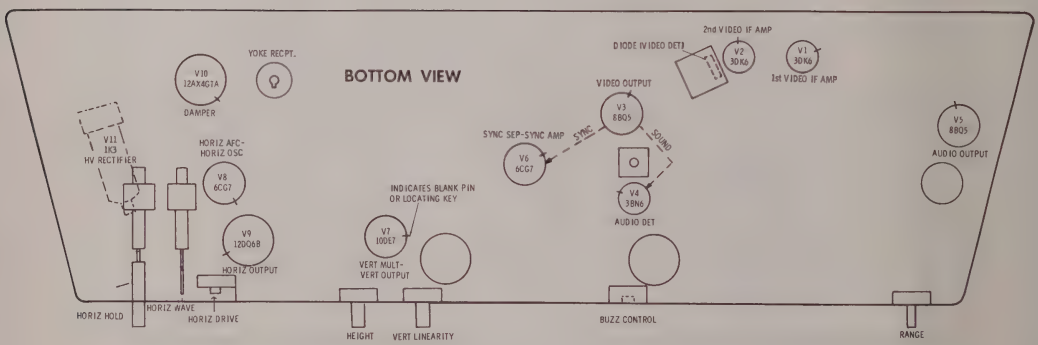
UHF TUNER 25A1193-1

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3DK6	● 800K	56Ω	60Ω	55Ω	† 10K	† 10K	0Ω		
V2	3DK6	0Ω	150Ω	55Ω	50Ω	†3000Ω	†3000Ω	0Ω		
V3	8BQ5	NC	1meg	●90Ω	90Ω	80Ω	NC	†3600Ω	NC	†2500Ω
V4	3BN6	●150Ω	6Ω	45Ω	50Ω	†7200Ω	6Ω	†330K		
V5	8BU5	100Ω	NC	150Ω	100Ω	90Ω	NC	†930Ω	NC	†520Ω
V6	6CG7	†1.5meg	2.2meg	0Ω	75Ω	80Ω	†13K	47K	0Ω	0Ω
V7	10DE7	†405Ω	NC	1.5meg	60Ω	75Ω	● †3meg	● 200K	0Ω	● 2200Ω
V8	6CG7	†56K	340K	0Ω	25Ω	20Ω	†52Ω	1.4meg	350K	0Ω
V9	12DQ6B	TP	32Ω	TP	†95K	1meg	NC	45Ω	0Ω	TOP CAP †8Ω
V10	12AX4GTA	TP	NC	¶	NC	†52Ω	TP	7Ω	20Ω	
V11	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †400Ω
V12	23YP4	32Ω	●32K	Pin 6 †100K	Pin 10 †10meg	Pin 11 ●320K	Pin 12 25Ω			
V201	2CY5	● 10K	0Ω	5Ω	7Ω	†2500Ω	†12K	0Ω		
V202	5CG8	15K	†12K	0Ω	5Ω	0Ω	†5000Ω	†50K	0Ω	242K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM OUTPUT OF M1.
† MEASURED FROM PIN 3 OF V10.
NC NO CONNECTION
TP TIE POINT





TUBE PLACEMENT CHART

PHOTOFACT® Folder

**PRODUCTION CHANGE
BULLETIN 267**

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 9 IN SET 480

PACKARD BELL MODEL RPC-10
(CH. DPA-5, DPA-20)

Packard-Bell Model RPC-2 (Ch. DPA-5, DPA-20) was covered in PHOTOFACT Folder 9 - Set 480.

Model RPC-10 is electrically identical except for the following addition.

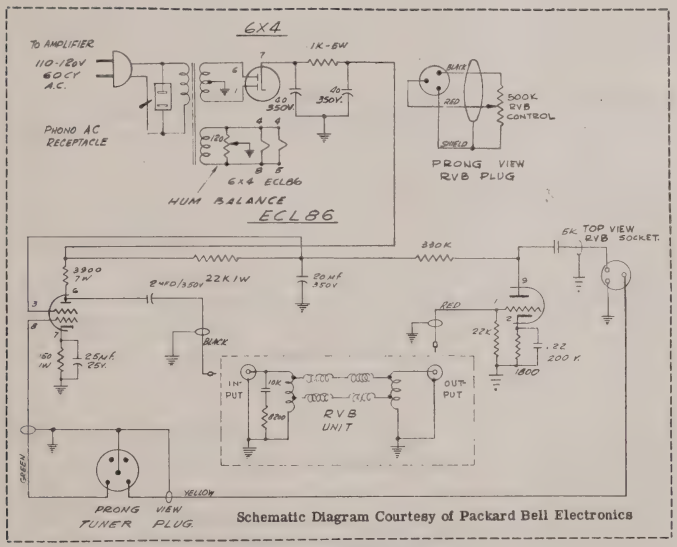
REVERBERATION AMPLIFIER ADDED

Model RPC-10 is the same as RPC-2 except for the Reverberation Unit RVB-1.

A schematic diagram showing this unit is given in this bulletin.

PRODUCTION CHANGE
BULLETIN 267

PRODUCTION CHANGE
BULLETIN 267



Schematic Diagram Courtesy of Packard Bell Electronics

PACKARD BELL MODEL RVB-1

SET 546 FOLDER 3

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 4 IN SET 524

AIRLINE MODELS WG-2805B, WG-2807B, WG-2825B, WG-2826B, WG-2827B

Airline Models WG-2805A, WG-2806A, WG-2807A were covered in PHOTOFACT Folder 4 - Set 524.

Models WG-2805B, WG-2807B, WG-2825B, WG-2826B, WG-2827B are electrically similar except for the following changes.

COMPONENTS ADDED

A 9mmf Capacitor (Part #47X632) is added from Pin 1 of V5 (6BA6) to ground.

COMPONENT CHANGES

C3 is decreased from 66mfd to 33mfd @ 10VNP (Part #45X481).

C4 is decreased from 66mfd to 33mfd @ 10VNP (Part #45X481).

F.M. TUNING UNIT CHANGED

M3 (FM Tuning Unit) is revised. A schematic diagram showing the revisions is given in this bulletin.

Models WG-2825B, WG-2826B, WG-2827B

SPEAKER CHANGES

SP2 (Speaker) is changed from a 12" speaker to an 8" speaker (Part #12A589).

A 220Ω Resistor and a 4" speaker (Part #2A543-2) in series, is added from the junction of SP2 & C3 to ground.

A 220Ω Resistor and a 4" speaker (Part #2A543-2) in series, is added from the junction of SP2 & C4 to ground.

(Continued On The Reverse Side)

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 531

PHILCO MODELS J3049L, J3208, J3210PL, J3212AQ, G, GL, J3214SG, SL, WL, UJ3049L, UJ3210PL, UJ3212AQ, G, GL, UJ3216SG, WL (CH. 11H25, U, 11J27, U)

Philco Models J3049L, J3208, J3210PL, J3212AQ, G, GL, J3214SG, SL, WL, UJ3049L, UJ3210PL, UJ3212AQ, G, GL, UJ3216SG, WL (CH. 11H25, U, 11J27, U) were covered in PHOTOFACT Folder 2 - Set 531.

The folowing changes were made by the manufacturer during late production.

Ch. 11H25 Run 2

TO FACILITATE PRODUCTION

M4 (Tuner) is changed to Part #76-11971-3.

C39 is changed from .0039 @ 600 volts to .0039 @ 100 volts (Part #30-4695-5).

Run 3

TO FACILITATE PRODUCTION

The 47mmf capacitor connected from pin 1 of V9 (9AU7) to ground is omitted.

Run 4

TO INCREASE HEIGHT RANGE

R35 is changed to 1.8meg (Part #66-5188350).

Ch. 11J25 Run 2

TO FACILITATE PRODUCTION

The 47mmf capacitor connected from pin 1 of V9 (9AU7) to ground is omitted.

Run 3

TO IMPROVE HORIZONTAL SYNC

R52 is increased from 1200Ω to 1500Ω (Part #66-2158340).

Run 4

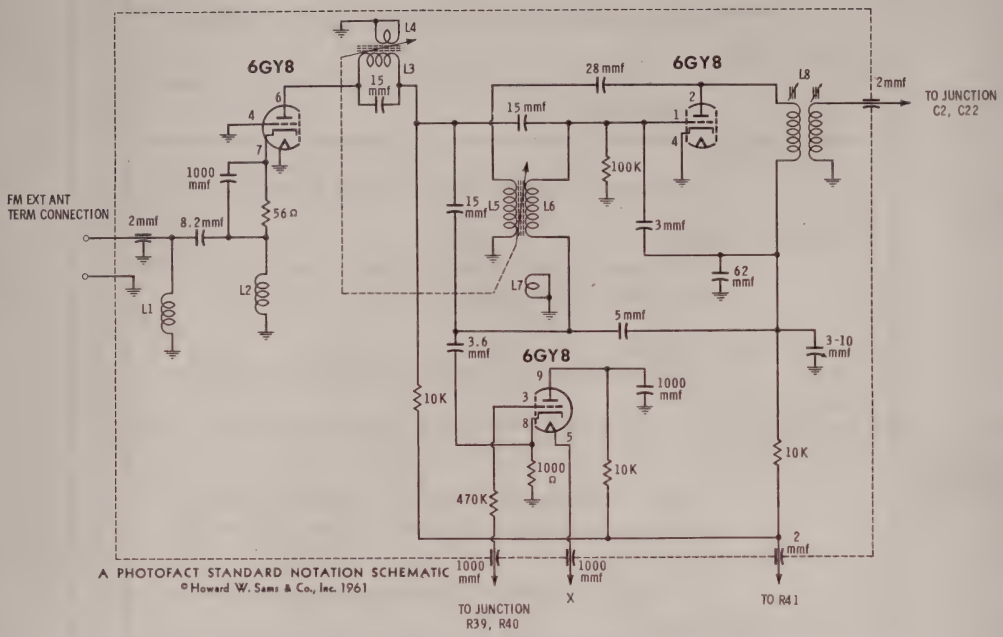
TO FACILITATE PRODUCTION

C39 is changed from .0039 @ 600 volts to .0039 @ 100 volts (Part #30-4695-5).

Run 5

TO IMPROVE HORIZONTAL HOLD

R52 is decreased from 1500Ω to 1200Ω 5% (Part #66-218240).



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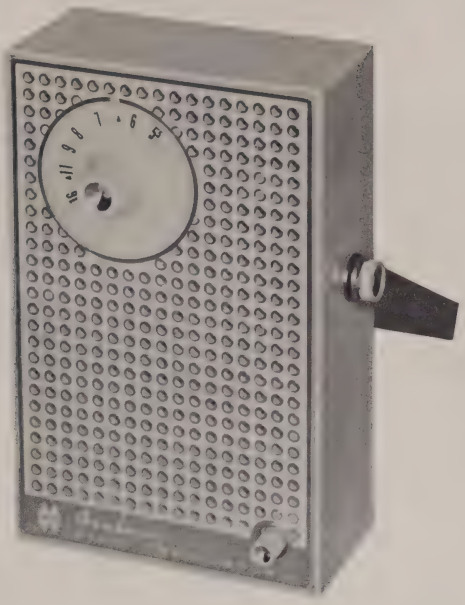
PHOTOFACT® Folder with CIRCUITRACE®

AIRLINE MODEL GEN-1214A

AIRLINE MODEL GEN-1214A



AIRLINE MODEL GEN-1214A

TRADE NAME	Airline Model GEN-1214A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago 7, Illinois
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	6 Volts DC RATING 10MA @ 6 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540 — 1600KC 15MA @ 6 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A4.... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

A3, A5..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1640KC	"	"	A3	"
3.	"	540KC	Tuning gang fully closed.	"	A4	"
4.	"	1400KC	1400KC Signal.	"	A5	Adjust for maximum output. Repeat Steps 2, 3 and 4.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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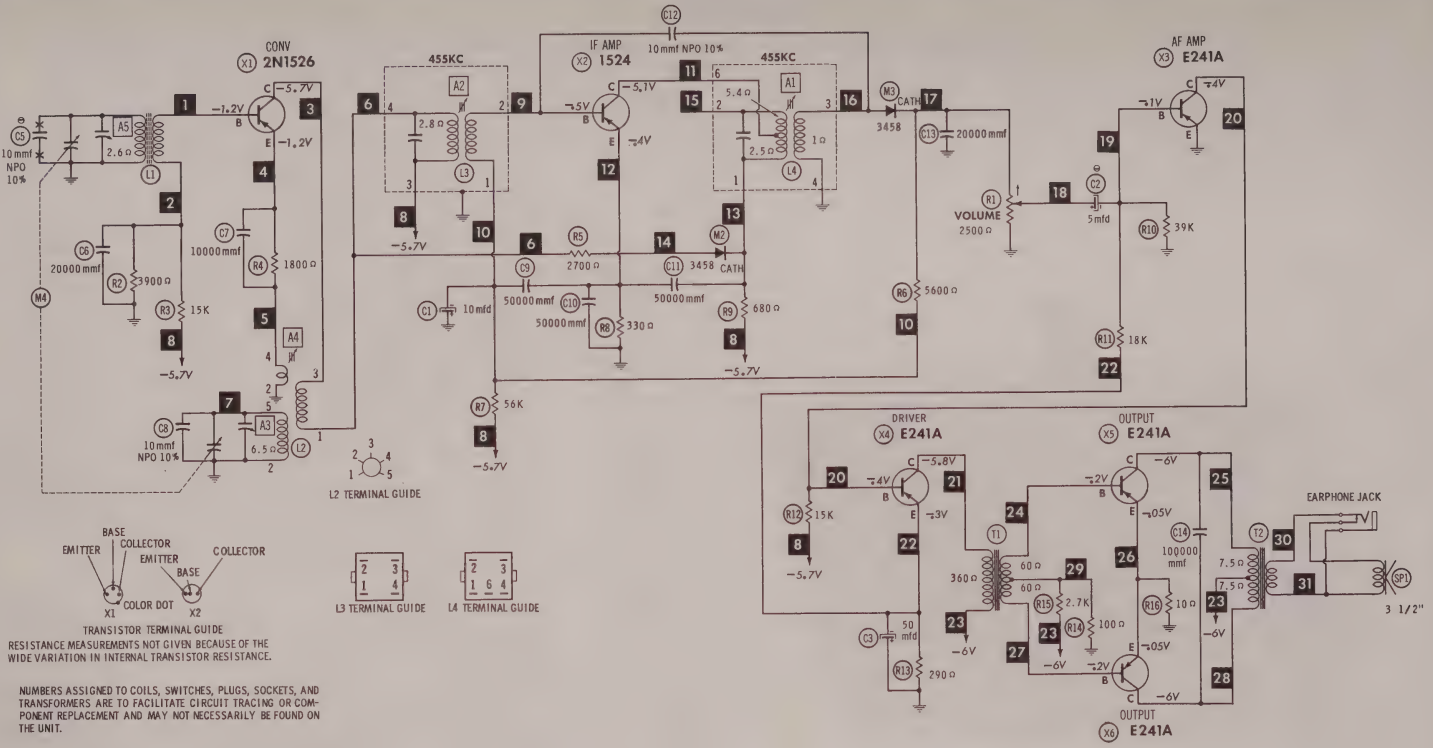
KF 684

SET 546 FOLDER 4



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE™

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AIRLINE MODEL GEN-1214A

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1526	Converter				PNP
X2	1524	IF Amplifier				PNP
	2N1524*	IF Amplifier				
X3	E241A	AF Amplifier				PNP
	3550*	AF Amplifier				
X4	E241A	Driver				PNP
	3550*	Driver				
X5	E241A	Output				PNP
	2N406*	Output	2N406	2N362	2N406	
X6	E241A	Output				PNP
	2N406*	Output	2N406	2N362	2N406	

* Alternate Type.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	10	E3238	PTT39	NLW10-15	TT12X10	MLV10-10	TE-1114	①
C2	5	10		PTT37	NLW5-15	TT12X5	MLV5-12	TE-1127	
C3	50	10	E3240	PTT45	NLW50-10	TT10X50	MLV50-10	TE-1119	
C4	50	10	E3240	PTT45	NLW50-10	TT10X50	MLV50-10	TE-1119	

① Some versions may use 3mfd@7V in this application (Part #E3239).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10 NPO 10%	Note 1	NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C6	20000		BPD-02	DD-203	H-05S2	CCD-203	TA-120	TG-S20
C9	10000		BPD-01	DD-103	H-05S1	CCD-103	TA-110	TG-S10
C8	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C9	50000		BPD-05	DD-503	H-05S5		TA-150	TG-S50
C10	50000		BPD-05	DD-503	H-05S5		TA-150	TG-S50
C11	50000		BPD-05	DD-503	H-05S5		TA-150	TG-S50
C12	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C13	20000		BPD-02	DD-203	H-05S2	CCD-203	TA-120	TG-S20
C14	100000		C80V104AM	DDA-104	H-05P1		TA-010	TG-P10

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A B	5000Ω Switch	½	E2556A					Volume Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	3900Ω				R10	39K			
R3	15K				R11	18K			
R4	1800Ω				R12	15K			
R5	2700Ω				R13	290Ω			
R6	5600Ω				R14	100Ω			
R7	56K				R15	2700Ω			
R8	330Ω				R16	10Ω			
R9	680Ω				R17	100Ω			

PRINTED BOARD

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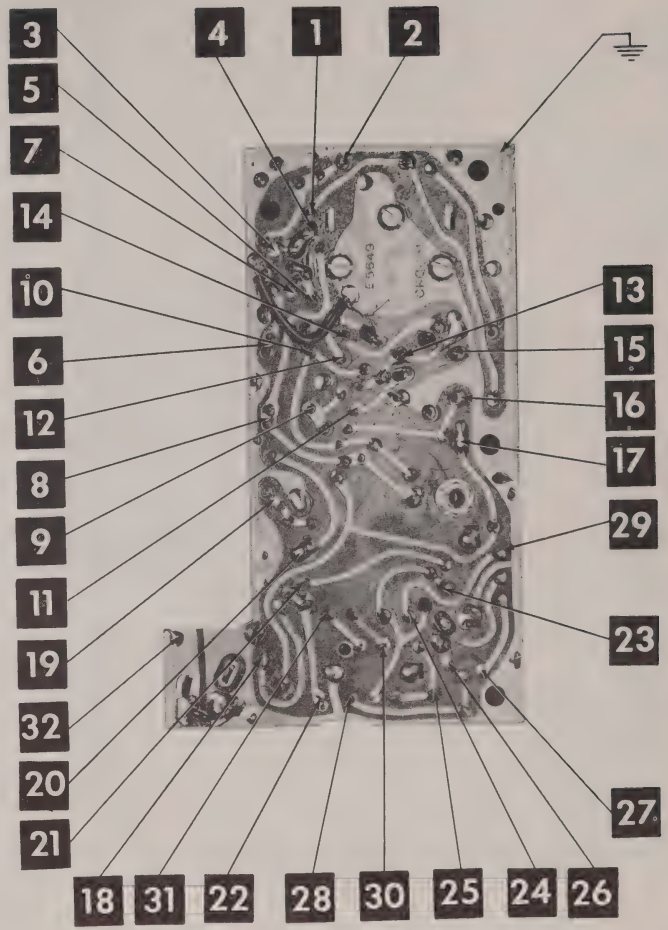


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		AIRLINE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick	E6035B					
L2	Oscillator	E6144A					
L3	Input IF	E6262A					
L4	Output IF	E6263A					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.8	1	E1132B					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	AIRLINE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1200Ω CT	3-4Ω	E1133B					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP1	3½"	PM	3-4Ω	E1059	3A05 *	* Trim Mounting to fit

BATTERIES

ITEM No.	VOLTAGE	AIRLINE PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	62-67		930 *		1015*		M-15R*	* 4 Required

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		AIRLINE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	3458	E2412				Overload Detector
M3	3458	E2412				

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M4	Tuning Cap. Printed Board	E3530B E5649	2 Gang

CABINETS & CABINET PARTS

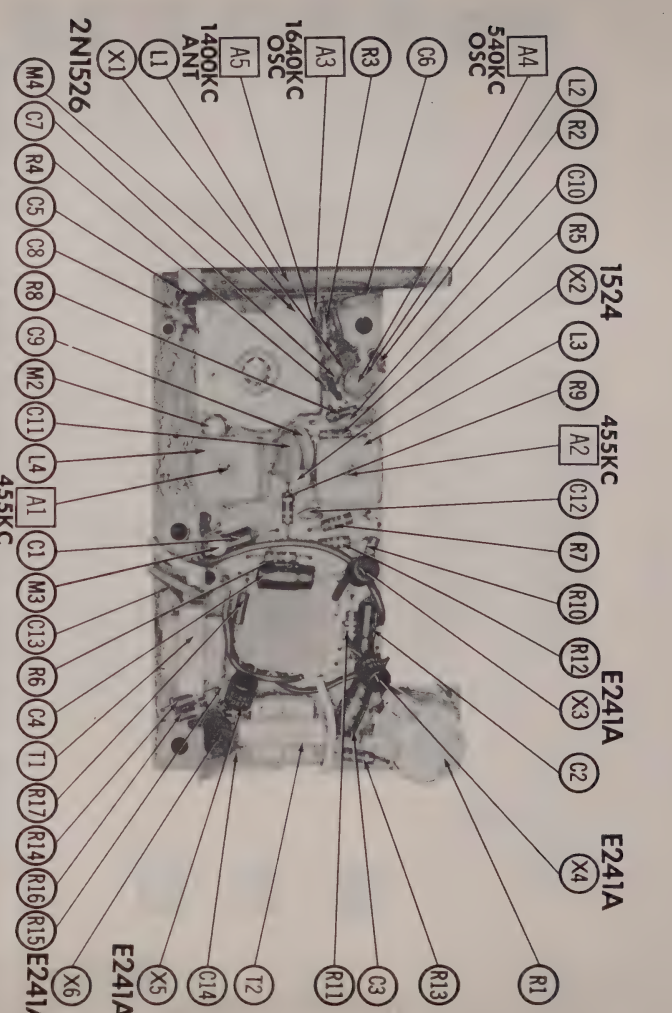
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	E50148C	Tuning
Knob	E50147B	Volume
Cabinet	E70109D	Back
Cabinet	E70118D	Front
Handle	E40135B	Metal, Carrying

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

AMERICANA
MODEL FC60

AMERICANA
MODEL FC60

AMERICANA
MODEL FC60

TRADE NAME	Americana Model FC60
IMPORTER	Americana Industries, Inc., 170 Broadway, New York 33, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC RATING 8MA @ 9 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST 540 – 1600KC	20MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A5.. GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2522, 2523, 2531, 2532, 2534, 2537, 2538, 2520
A4, A6..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2	"	1600KC	1600KC	"	A4	"
3.	"	600KC	600KC	"	A5	"
4.	"	1400KC	1400KC Signal.	"	A6	Adjust for maximum output. Repeat Steps 2, 3 and 4.

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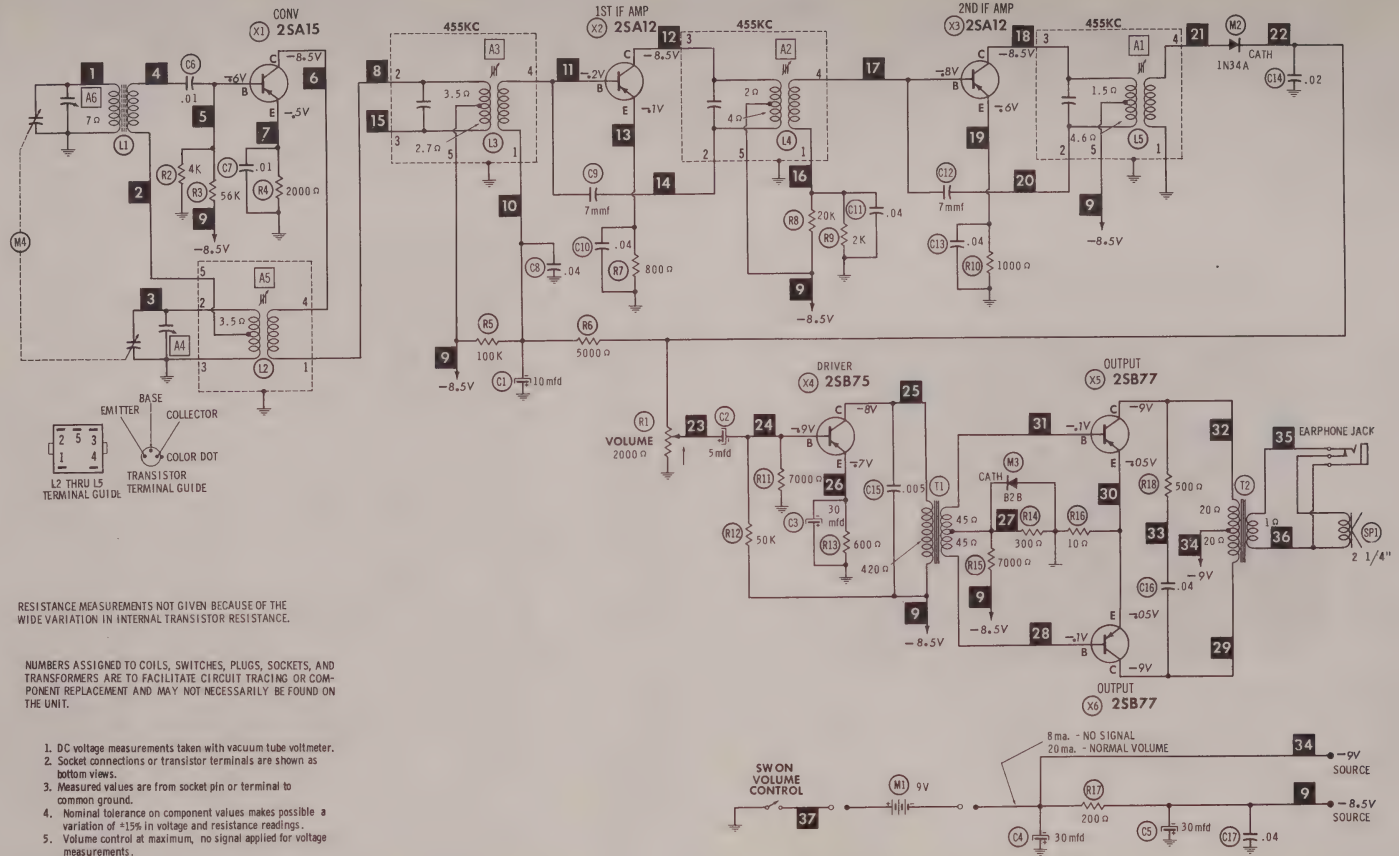
KF687

SET 546 FOLDER 5



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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AMERICANA MODEL FC60

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2SA15	Converter				PNP
X2	2SA12	1st IF Amplifier				PNP
X3	2SA12	2nd IF Amplifier				PNP
X4	2SB75	Driver	2N406			PNP
X5	2SB77	Output	2N408			PNP
X6	2SB77	Output	2N408			PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	AMERICANA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	6		PTT23	NLW10-6	TT6X10	MLV10-6	TE-1087	
C2	5	3		PTT4	NLW5-15	TT6X5	MLV5-3	TE-1052, 2	
C3	30	3		PTT10	NLW30-6	TT6X30	MLV35-15	TE-1158	
C4	30	10		PTT43	NLW30-15	TT15X30	MLV35-15	TE-1158	
C5	30	10		PTT43	NLW30-15	TT15X30	MLV35-15	TE-1158	

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	.01		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C7	.01		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C8	.04							
C9	7		NPO-DI 6.8	DTZ-6R8	C10V7C	CCTO-6R8	CNO-568	10TCC-V68
C10	.04							
C11	.04							
C12	7		NPO-DI 6.8	DTZ-6R8	C10V7C	CCTO-6R8	CNO-568	10TCC-V68
C13	.04							
C14	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C15	.005		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C16	.04							
C17	.04							

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AMERICANA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	2000Ω	1/4						Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R2	4000Ω			
R3	56K			
R4	2000Ω			
R5	100K			
R6	5000Ω			
R7	800Ω			
R8	2000Ω			
R9	20K			
R10	1000Ω			

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R11	7000Ω			
R12	50K			
R13	600Ω			
R14	300Ω			
R15	7000Ω			
R16	10Ω			
R17	200Ω			
R18	500Ω			

PRINTED BOARD

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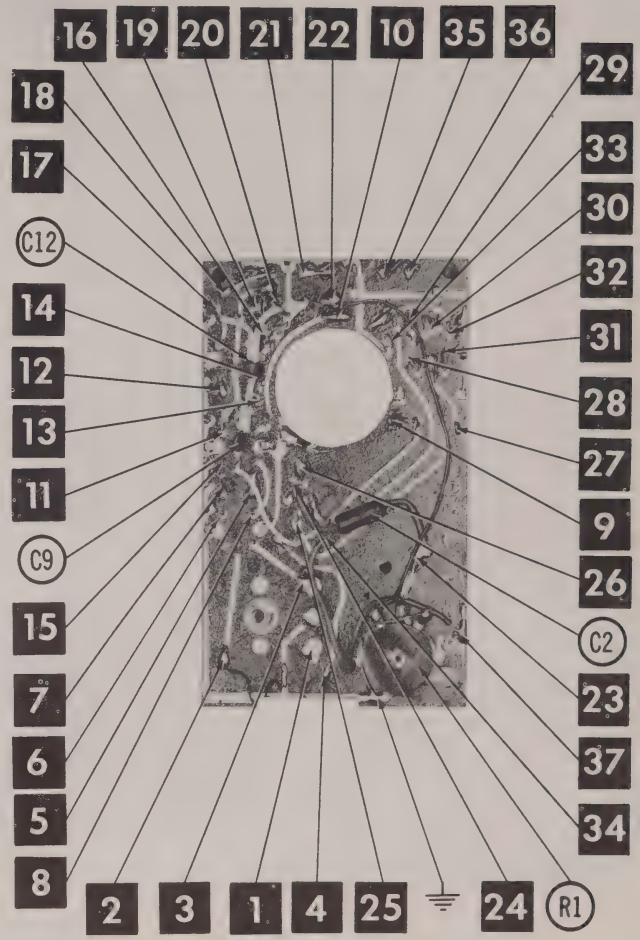


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		AMERICANA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick						
L2	Osc.						
L3	1st IF						
L4	2nd IF						
L5	3rd IF						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	AMERICANA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.6	1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	AMERICANA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1500Ω CT	6-8Ω						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AMERICANA PART No.	QUAM PART No.	
SP1	2 1/4"	PM	6-8Ω			

BATTERIES

ITEM No.	VOLTAGE	AMERICANA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	006B		2U6		216		M-1604	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		AMERICANA PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N34A			1N34A	1N34A	Detector (Pigtail)
M3	B2B					Output Bias Regulation (Pigtail)

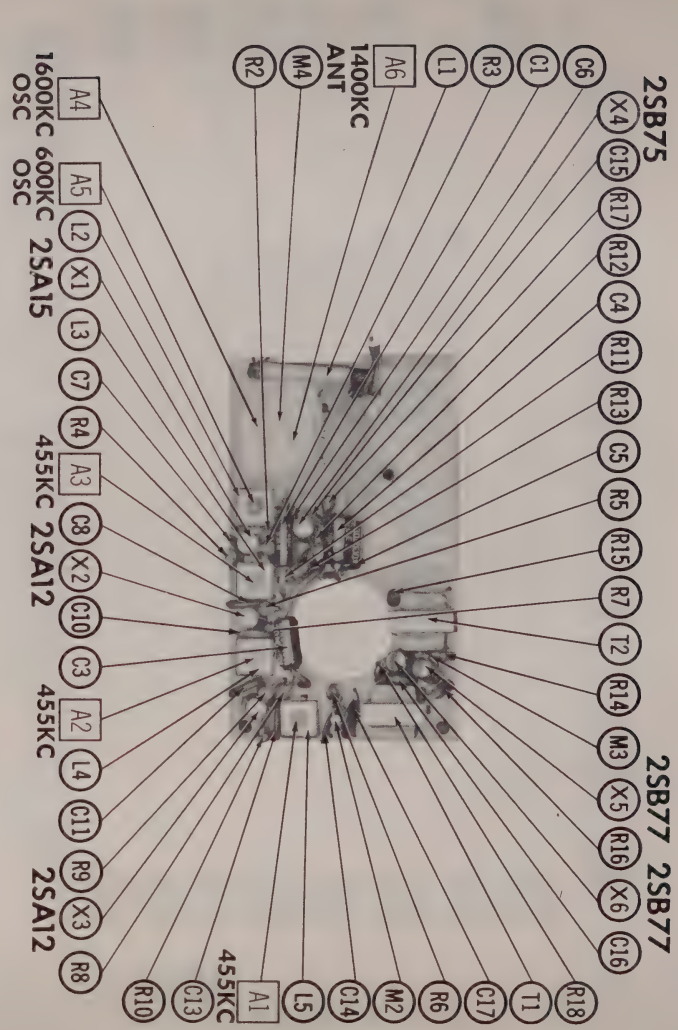
MISCELLANEOUS

ITEM No.	PART NAME	AMERICANA PART No.	NOTES
M4	Tuning Cap.		2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

CROWN
MODEL STP-30

CROWN
MODEL STP-30

CROWN
MODEL STP-30

TRADE NAME	Crown Model STP-30		
IMPORTER	Shriro, Inc., 276 Fourth Ave., New York 10, N. Y.		
TYPE SET	Battery Operated Transistorized Stereo Amplifier With 3 Speed Manual Record Player		
POWER SUPPLY	9 Volts DC	RATING	15 MA @ 9 Volts DC (No Signal, Less Motor)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2SB75	Left Channel AF Amp.				PNP
	2N215*	Left Channel AF Amp.	2N407	2N362	2N104	PNP
X2	2SB75	Left Channel Driver				PNP
	2N215*	Left Channel Driver	2N407	2N362	2N104	PNP
X3	2SB77	Left Channel Output				PNP
	2N217*	Left Channel Output	2N407	2N361	2N217	PNP
X4	2SB77	Left Channel Output				PNP
	2N217*	Left Channel Output	2N407	2N361	2N217	PNP
X5	2SB75	Right Channel AF Amp.				PNP
	2N215*	Right Channel AF Amp.	2N407	2N362	2N104	PNP
X6	2SB75	Right Channel Driver				PNP
	2N215*	Right Channel Driver	2N407	2N362	2N104	PNP
X7	2SB77	Right Channel Output				PNP
	2N217*	Right Channel Output	2N407	2N361	2N217	PNP
X8	2SB77	Right Channel Output				PNP
	2N217*	Right Channel Output	2N407	2N361	2N217	PNP

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	CROWN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	6	6		PTT21	NLW6-15	TT10X6	MLV5-6	TE-1085	
C2	30	6		PTT27	NLW30-6	TT6X30	MLV30-6	TE-1092	
C3	6	6		PTT21	NLW6-15	TT10X6	MLV5-6	TE-1085	
C4	30	6		PTT27	NLW30-6	TT6X30	MLV30-6	TE-1092	
C5	200	10		PTT47	NLW200-12		MLV200-10	TE-1119.6	
C6	6	6		PTT21	NLW6-15	TT10X6	MLV5-6	TE-1085	
C7	30	6		PTT27	NLW30-6	TT6X30	MLV30-6	TE-1092	
C8	6	6		PTT21	NLW6-15	TT10X6	MLV5-6	TE-1085	
C9	30	6		PTT27	NLW30-6	TT6X30	MLV30-6	TE-1092	
C10	200	10		PTT47	NLW200-12		MLV200-10	TE-1119.6	
C11	200	10		PTT47	NLW200-12		MLV200-10	TE-1119.6	
C12	200	10		PTT47	NLW200-12		MLV200-10	TE-1119.6	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C13	.05 50V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50
C14	.05 50V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S50

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CROWN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	50K	½						Volume, Left Channel
R2A	50K							Volume, Right Channel
B	Switch							

(CONTINUED ON REAR PAGE)

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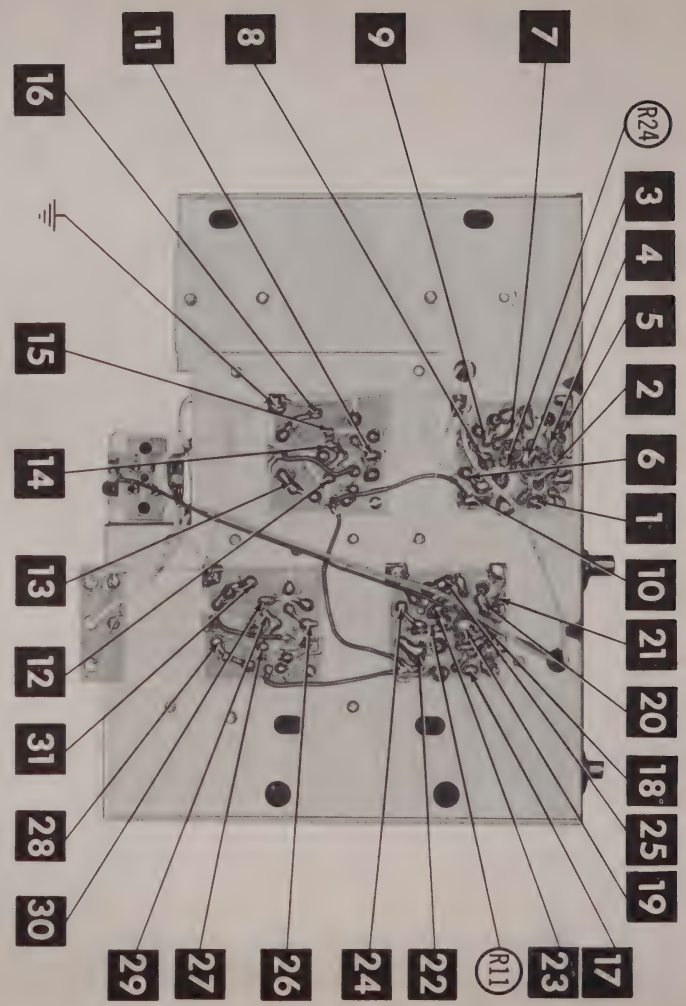
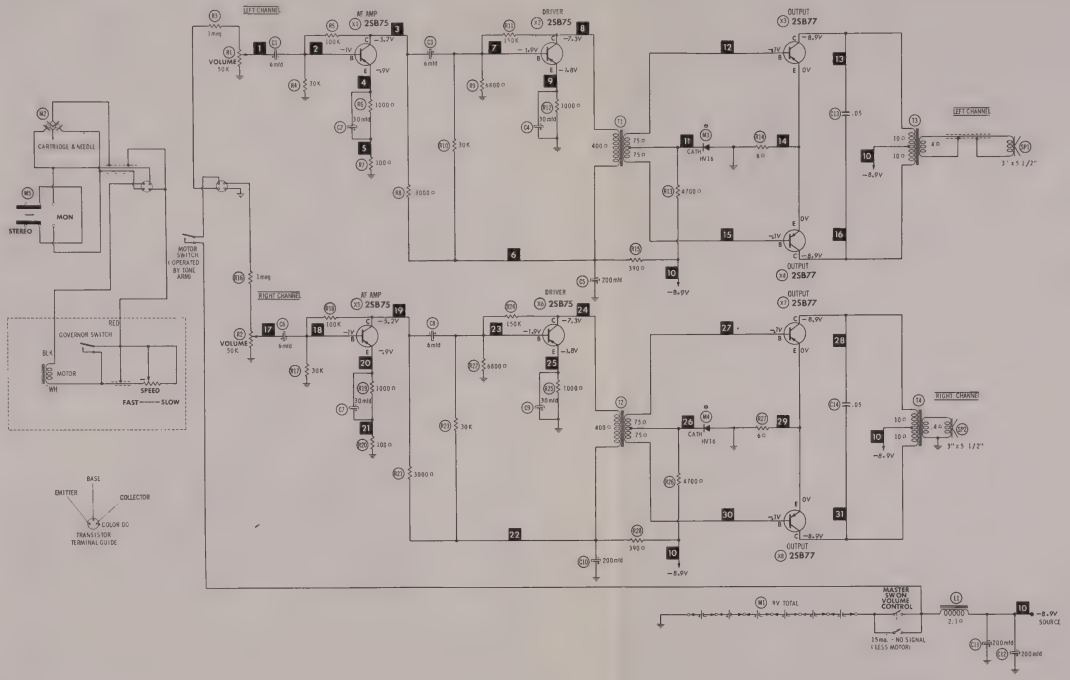
PRINTED BOARD





RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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CROWN
MODEL STP-30

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	1meg			
R4	30K			
R5	100K			
R6	1000Ω			
R7	100Ω			
R8	3000Ω			
R9	6800Ω			
R10	30K			
R11	150K			
R12	1000Ω			
R13	4700Ω			
R14	6Ω			
R15	390Ω			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R16	1meg			
R17	30K			
R18	100K			
R19	1000Ω			
R20	100Ω			
R21	3000Ω			
R22	6800Ω			
R23	30K			
R24	150K			
R25	1000Ω			
R26	4700Ω			
R27	6Ω			
R28	390Ω			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	CROWN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L1		2.1Ω	48mh						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	CROWN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1, 2	1	TRT-9					
T2	1, 2	1	TRT-9					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	CROWN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	350Ω CT	3-4Ω	TRT-10					
T4	350Ω CT	3-4Ω	TRT-10					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CROWN PART No.	QUAM PART No.	
SP1	3"x 5"	PM	3-4Ω			
SP2	3"x 5"	PM	3-4Ω			

BATTERIES

ITEM No.	VOLTAGE	CROWN PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	UM-6		230		A 100		M-13R	6 Required

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

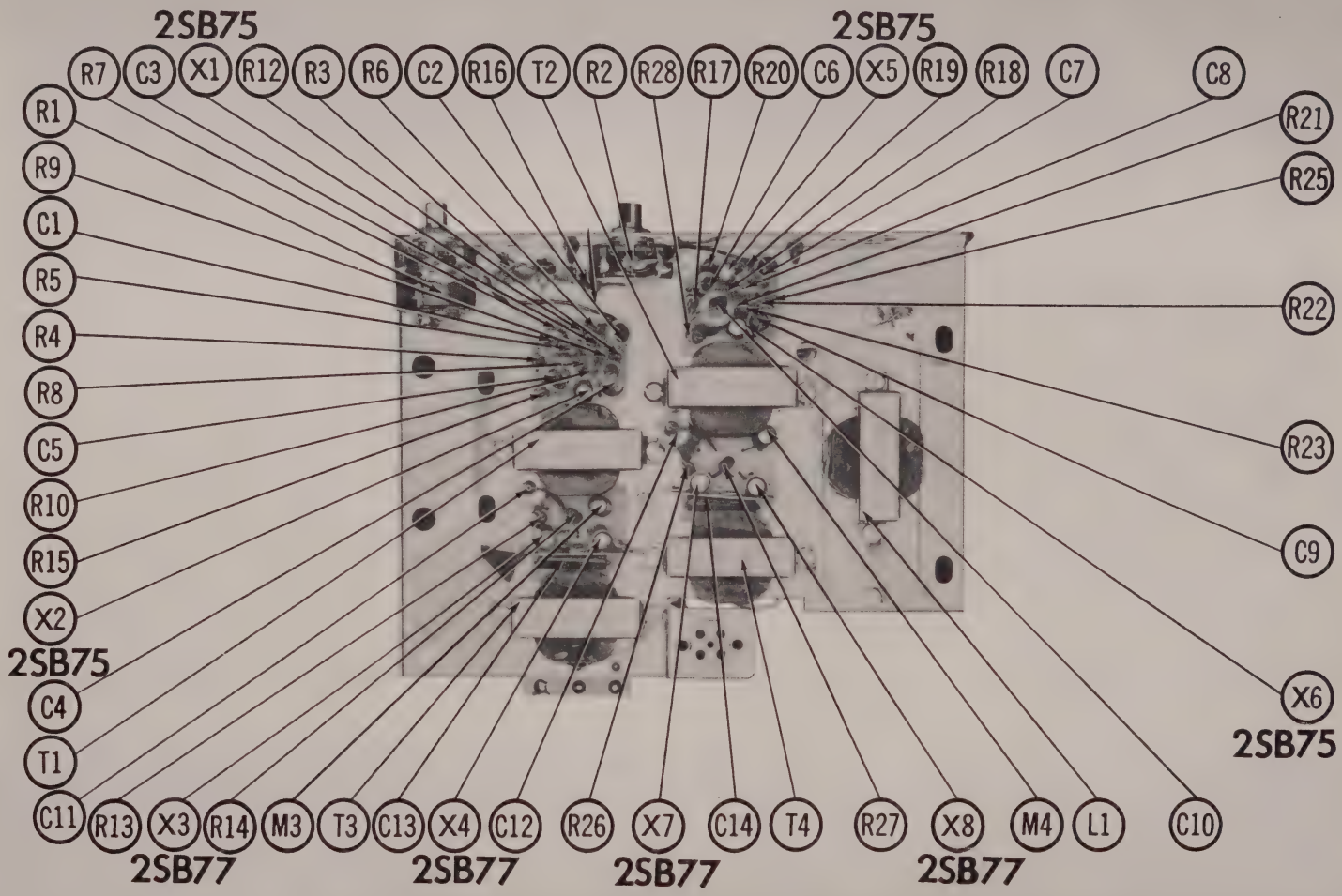
ITEM No.	REPLACEMENT DATA								NOTES
	CROWN PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2			KR-74-TS †	N8-7 * (LP)	96T	Not Req.	12THA-S T8C1-12THA-S†	N-12THA-S	† Includes Tone Arm
				N8-3 * (78RPM)					

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		CROWN PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	HV16 *					Output Bias Regulation
M4	HV16*					* Alternate Type HV13

MISCELLANEOUS

ITEM No.	PART NAME	CROWN PART No.	NOTES
M5	Switch		Stereo-Mono (DPDT Slide Type)



CHASSIS TOP VIEW

PHOTOFACT® Folder

FANON MODELS CS-33, 3335

FANON MODELS
CS-33, 3335

FANON MODELS
CS-33, 3335

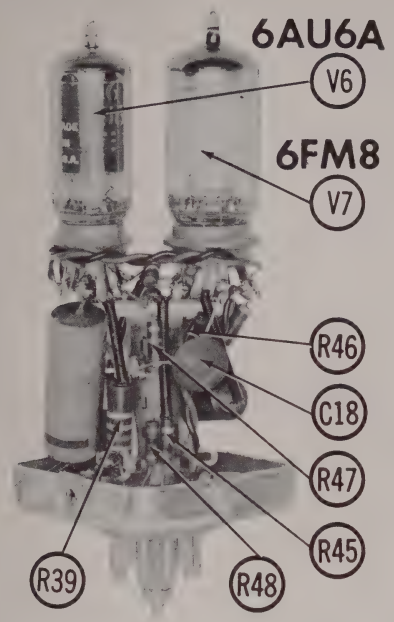
TRADE NAME	Fanon Models CS-33, 3335
MANUFACTURER	Fanon Electronic Sales Corp., 919 Park Place, Brooklyn 13, N. Y.
TYPE SET	AC Operated 6 Tube Audio Amplifier (Model CS-33 is a 2 tube unit to protect output tubes against speaker line shorts or overloads)
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 120 Watts, 1 Amp. @117 Volts AC

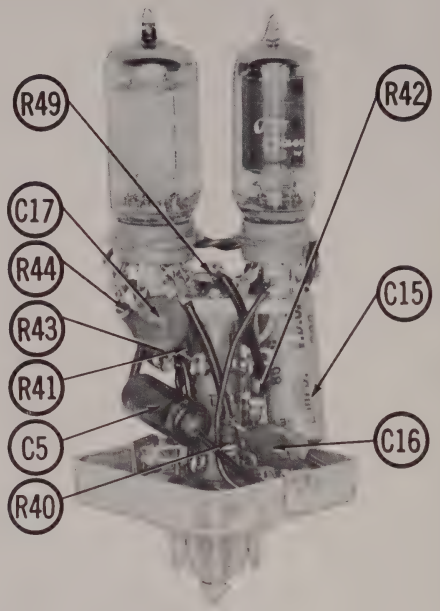
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

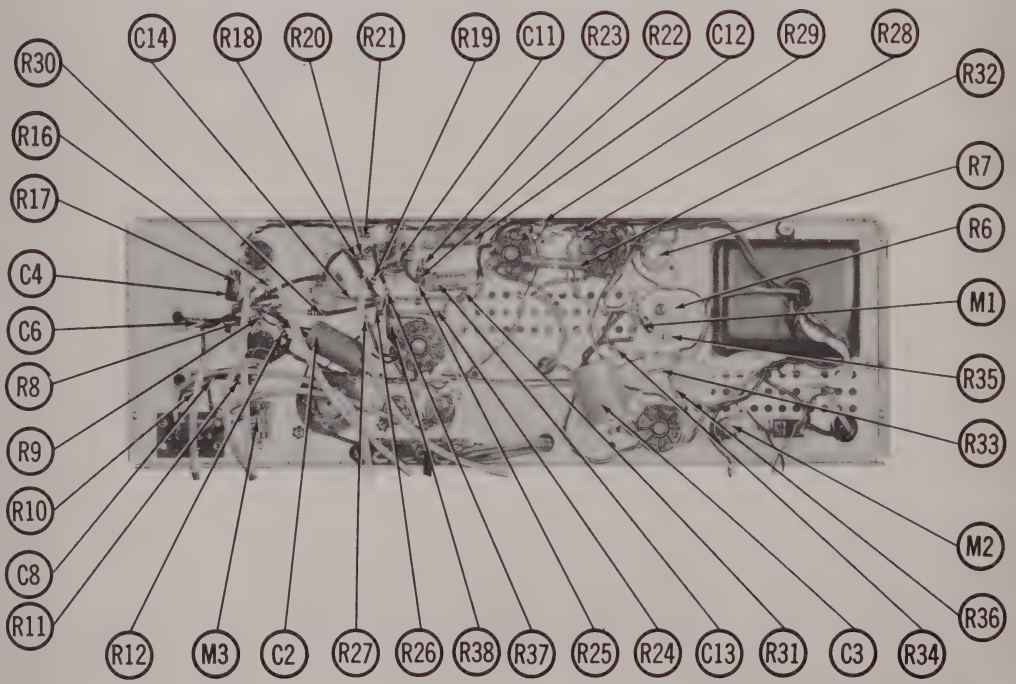
KX708

SET 546 FOLDER 7





MODEL CS-33 ("CIRCUIT SENTRY")



CHASSIS-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •		
ITEM No.	USE	TYPE
V1	Mic 1 Preamp. - Mic 2 Preamp.	12AX7
V2	AF Amp.	6AV6
V3	AF Amp, -Phase Inv.	12AX7
V4	Output	6L6GC
V5	Output	6L6GC
V6	Bias Control	6AU6A
V7	Bias Control	6FM8
V8	Rectifier	GZ34/5AR4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FANON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲20	500	173-10	AFH4-95	C0400	FP399.5	TMT-3865	TVL-3692	
B	■20	450							
C	▲5	350							
C2	5	350		PRS1600	BR435	TC60	TD-4-450	TVA-1601	
C3A	5	100			NLW5-150	TT150X5	MLV5-150	TE-1504	
B	5	100			NLW5-150	TT150X5	MLV5-150	TE-1504	
C4	40	10		PTT44	NLW40-10	TT15X40	MLV40-12	TE-1133	
C5	5	150		SRE150V5	NLW5-150	TC40	MLV5-150	TE-1504	

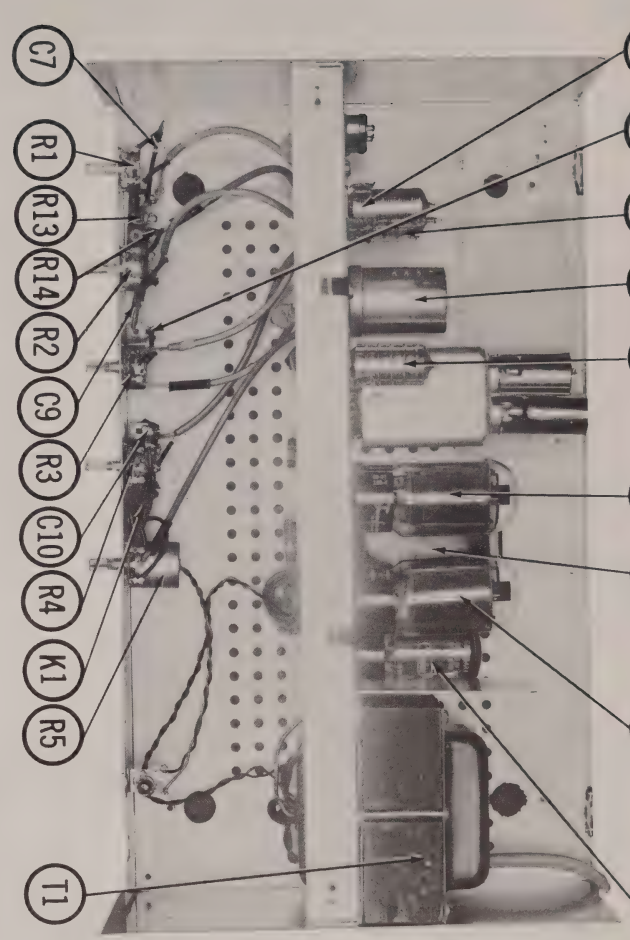
FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C7	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C8	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C10	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C11	.02		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C12	.033 400V		P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S33
C13	.033 400V		P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S33
C14	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C16	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FANON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	203-70	B-70	A47-1meg-Z	Q13-137	U53	Mic 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	1meg	½	203-70	B-70	A47-1meg-Z	Q13-137	U53	Mic 2 - Magnetic
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	2meg 1meg Tap	½	203-93	BT-78	A47F3-2meg	Q18-139X		Phono-Radio
B	Shaft			Not Req.	KSS-3	Not Req.		
R4A	1meg	½	203-70	B-70	A47-1meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R5A	1meg	½	200-72	B-70-S	A47-1meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R6A	150K	½	203-40	TT-46	B47-150K-S	Bil-328	TA184L	Bias Adj.
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R7A	100Ω	2(WW)	209-03	WN-101	A43-100	W11-084	R100L	Hum Balance
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	

CHASSIS—SIDE VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R8	2.2meg 1W			
R9	470K			
R10	47K			Note 1
R11	2.2meg 1W			
R12	470K			
R13	220K			
R14	220K			
R15	220K			
R16	220K			
R17	1500Ω			
R18	1.5meg			
R19	470K			
R20	150K			
R21	470Ω			
R22	1meg			
R23	100K			
R24	6800Ω			
R25	3300Ω			
R26	100Ω			
R27	3900Ω			
R28	100K			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R29	100K			
R30	18K			
R31	27K 1W			
R32	560Ω 2W			
R33	220K			
R34	68K			
R35	100K			
R36	220K 1W			
R37	68K			
R38	100K			
R39	68K 1W			
R40	220K			
R41	2.2meg			
R42	100K			
R43	2200Ω			
R44	1meg			
R45	1meg			
R46	1meg			
R47	10K			
R48	1000Ω			
R49	1meg			

Note 1. Not used in some versions.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	FANON PART No.	REPLACEMENT DATA
K1	Tone Comp.	30mmf, 150mmf, .002mfd, .0025mfd, .02mfd, 10K, 100K, 100K	192-04	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	FANON PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V@ 1A	680VCT @, 160A DC	5V@ 1.9A	251-09		PM-8412①			① Tape CT on 6.3V Winding
	SEC. 3	SEC. 4	SEC. 5						
	6.3V@ 3.5A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	FANON PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6500Ω CT	70V Tap@ 16Ω, 8Ω, 4Ω	252-15					

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	FANON PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.001A	290-05		Model 12		Selenium

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FANON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	3A 125V			313003 (3AG 3A 125V)	342001	MDX 3	HKP

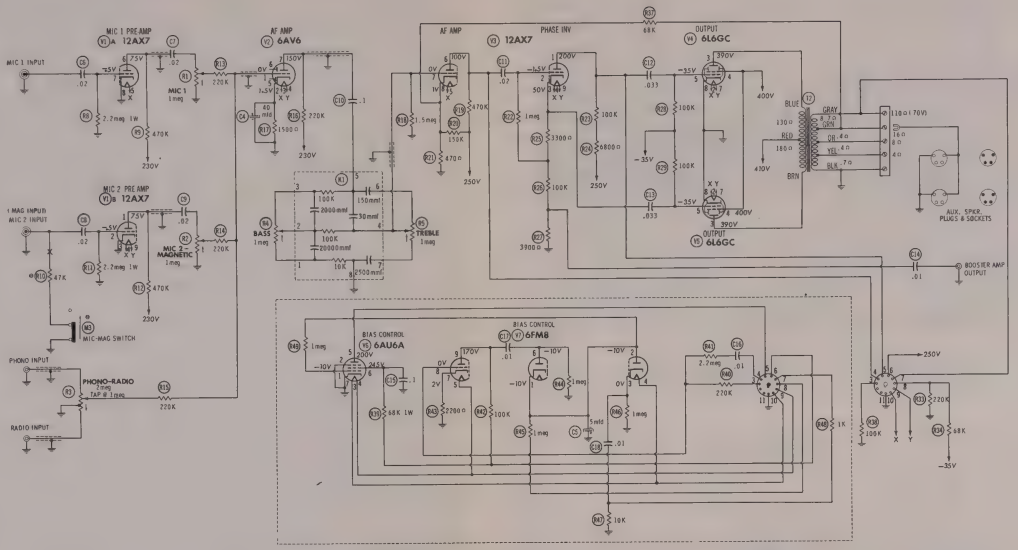
MISCELLANEOUS

ITEM No.	PART NAME	FANON PART No.	NOTES
M3	Switch		Crystal Magnetic Phono Selector (SPST Slide Type) Not used in some versions.

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†515K	2.2meg	0Ω	FIL	FIL	†515K	2.2meg	0Ω	
V2	6AV6	90K	1500Ω	FIL	FIL	NC	NC	†265K		
V3	12AX7	†130K	1.1meg	110K	FIL	FIL	†500K	85K	470Ω	FIL
V4	6L6GC	NC	FIL	†130Ω	†560Ω	200K	TP	FIL	0Ω	
V5	6L6GC	TP	FIL	†180Ω	†560Ω	200K	TP	FIL	0Ω	
V6	6AU6A	¶ 2meg	0Ω	FIL	FIL	†130K	†95K	0Ω		
V7	6FM8	¶ 1meg	¶ 1meg	1meg	FIL	FIL	1meg	2200Ω	320K	1130K
V8	GZ34 5AR4	NC	¶ 160K	NC	63Ω	NC	68Ω	NC	¶ 160K	

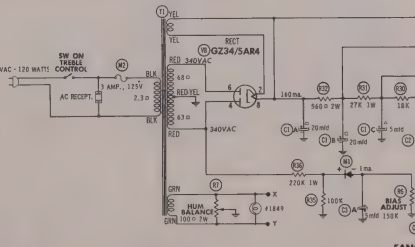
⊙ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±10% in voltage and resistance readings.
6. All controls at minimum, proper output load connected

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
* MEASURED FROM CATHODE.
† MEASURED FROM PIN 8 OF V8.

NC NO CONNECTION
TP TIE POINT



FANON MODELS CS-33, 3335

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PHOTOFACT® Folder with CIRCUITRACE®

FORD MODELS 04MD (1961), 14MD, 14MF, 14MFM

FORD MODELS 04MD (1961), 14MD, 14MF, 14MFM

MODEL 14MF

TRADE NAME	Ford Model 04MD (1961)* (C0AF-18805-D), 14MD(C1DD-18805-A) For 1961 Falcons 14MF (C1AF-18805-D) For 1961 Fords 14MFM (C1AF-18805-C) For 1961 Fords (* Model 04MD not underlined is 1960 version)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated 4 Tube - 2 Transistor Custom-Built AM Automobile Receiver
POWER SUPPLY	12 Volt Storage Battery RATING 1 Amp. @12.6 Volts DC
TUNING RANGE	540 — 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 Thru A4..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A8, A9, A10..... GENERAL CEMENT #9050-L, 9150
WALSCO #2521, 2524
All..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to antenna receptacle. Low side to chassis.	262.5KC (400% Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1610KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless tuner has been tampered with or associated components replaced. If necessary, back tuning cores (A8, A9, A10) 1 3/8 inches out of coil forms. Repeat Step 2.					
3.	Thru dummy to antenna receptacle.	1020KC	Tuner carriage 49/64" from high end stop.	Across voice coil.	A8, A9, A10	Adjust for maximum output. Repeat Steps 2 and 3 until no further improvement is noted. Cement cores in place.
4.	"	600KC @ 5 microvolts.	600KC Signal.	"	All	Adjust for 2.83 volts output.
5.	With radio tuned to a 1000KC signal, adjust pointer adjustment until pointer coincides with 1000KC mark on dial.					
6.	With radio installed in car and antenna fully extended, tune in a weak station near 1200KC and adjust A7 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Pull Pushbutton out.
2. Tune manually to desired station.
3. Press Pushbutton in firmly.
4. Repeat for remaining Pushbuttons.

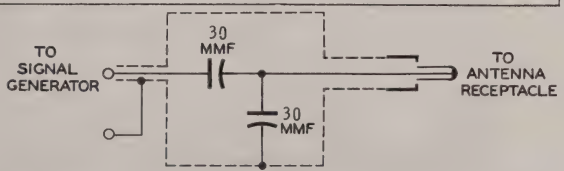

FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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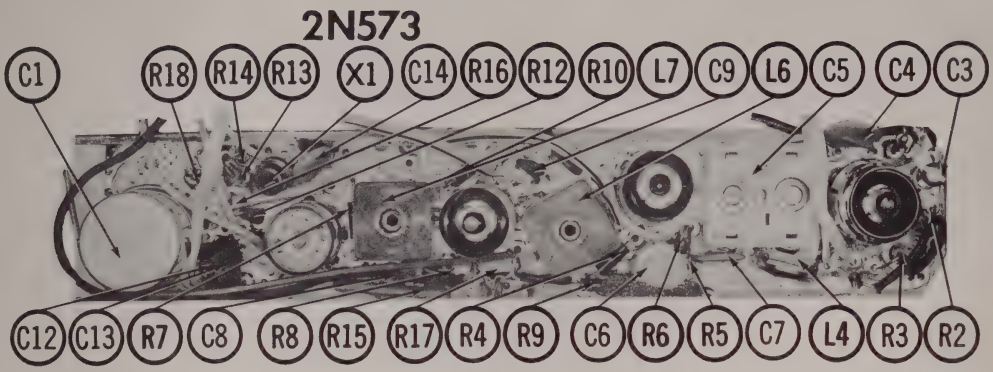
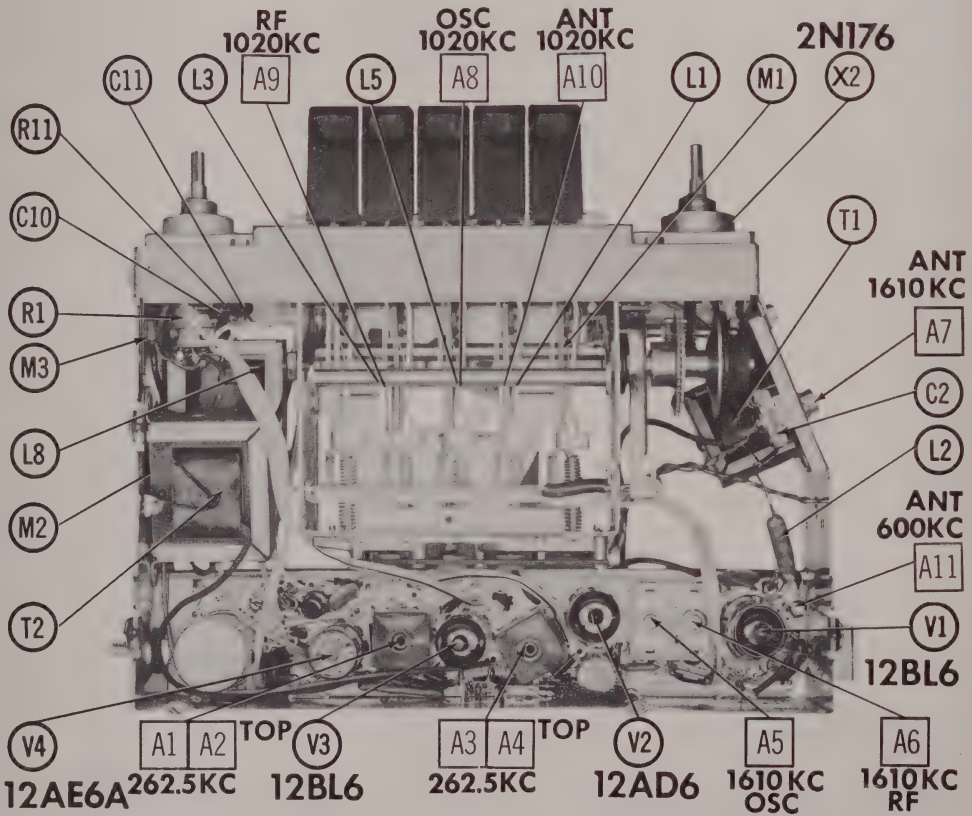
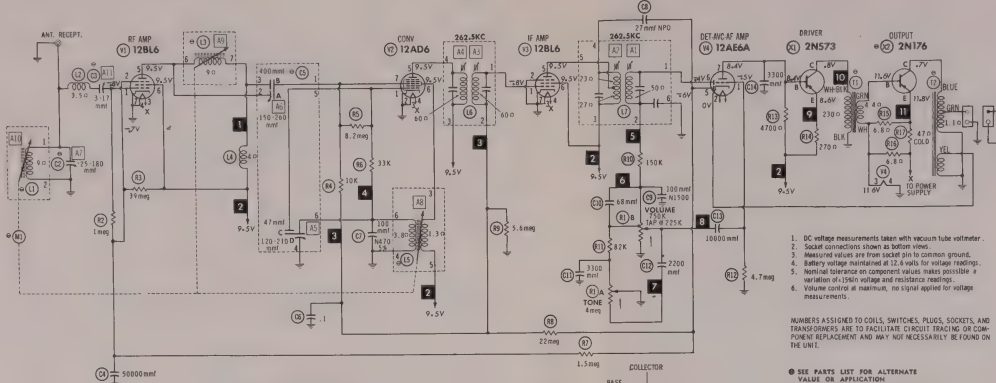
SET 546 FOLDER 8



PRINTED BOARD-TOP VIEW



CHASSIS-TOP VIEW



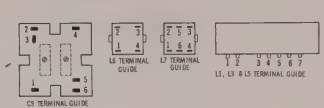
1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

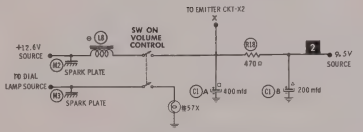
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BL6	17 meg	16 meg	0 Ω	5 Ω	480 Ω	470 Ω	0 Ω
V2	12AD6	33K	0 Ω	0 Ω	5 Ω	520 Ω	470 Ω	3.3 meg
V3	12BL6	3.3 meg	0 Ω	0 Ω	5 Ω	500 Ω	470 Ω	0 Ω
V4	12AE6A	4.7 meg	.1 Ω	.6 Ω	0 Ω	15 meg	700K	

TRANSISTOR CIRCUIT RESISTANCE FOR X1 AND X2 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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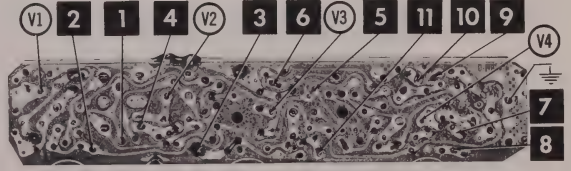


A Howard W. Sams CIRCUITRACE Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

FORD MODELS 04MD (1961), 14MD, 14MF, 14MFM

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	• GENERAL ELECTRIC •			RAYTHEON • SYLVANIA •	
V1	RF Amplifier	12BL6	V3	IF Amplifier	12BL6
V2	Converter	12AD6	V4	Det.-AVC-AF Amp.	12AE6A

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N573	Driver	2N591	2N573	2N573	PNP
X2	2N176	Output	2N176		2N176	PNP Note 1
	MN29*	Output	2N176			PNP Note 1

* Alternate

Note 1. When replacing, apply DC-4 grease (Part #11M490487) to both sides of insulator. Tighten mounting screws securely.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■400	16	23B561100	PWH2-02-75	B0045 †	PWP201.13	TMD-2025 ♦	PCLS-2173 *	
B	▲200	16							

† Use printed circuit adapters #55277 & 55278.
♦ Use printed circuit adapter kit TMA.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	25-180	#20B4037LA01①				464		
C3	3-17	#21K564055②		829-7				
C4	50000		BPD-05	DD-503	H-05S5	IDP-2-503	GP150	5HK-S50

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5A	150-260	#20K564680③						
B	400							
C	47		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
D	120-210							
C6	.1 100V		P2151N-1	DF-104	BC2P1J	IDP-2-104	ACE-401	2SE-P10
C7	100 N470 5%	#21R129849				*		
C8	27 NPO		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C9	100 N1500	#21R129848		TCZ-100		*		
C10	68		DI-68	DTZ-68	C10Q68C	CCTO-680	CNO-468	10TCC-Q47
C11	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C12	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	3300		BPD-0033	DD-332	BYA10D33	CCD-330	B-233	5HK-D33

* Not normally in distributor' s stock. Available thru distributor on order to manufacturer.
\# Motorola Part Number.
① Part #20K564677 used in Models 04MD, 14MD.
② Some versions may use 1-7.5mmf.
③ Part #20K564751 (C1D is 240-350mmf) used in Models 04MD, 14MFM.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	4meg	½	18C562768	F1-82		† QJ-1258A	■ UE4107-8	Tone
B	750K	½		R2-59				Volume
	225K Tap							
C	Switch			KR-7				Power Off-On

† "CONCENTRIKIT" Equivalent: K-8 Kit with Base Elements and Shafts:
B11-240, P17-105 (Panel)
B13-137X, R1-118 (Rear)
R5 (Retainer)
76-2 (Switch)

■ "STA-LOC" Equivalent: FB46L, RU754T25, OS1187, ES1625, US42.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	1meg			
R3	39meg			
R4	10K			
R5	8.2meg			
R6	33K			
R7	1.5meg			
R8	22meg			
R9	5.6meg			
R10	150K			

ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS
R11	82K			
R12	4.7meg			
R13	4700Ω			
R14	270Ω			
R15	6.8Ω			
R16	6.8Ω			
R17	.47Ω (Cold)			Pt.#17A563407
R18	470Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MOTOROLA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Ant.	24C536308 ①					
L2	RF Choke (31uh)	24A532148	TV-180	6176	RTC-8593	T301	
L3	RF	24C536308 ①					
L4	RF Choke (44uh)	24K563788		4628	RTC-8667	T864	
L5	Osc.	24B536300 ②					
L6	Input IF	24K564673	BC-344	13-PH1	RTC-8644	T655	
L7	Output IF	24K564671	BC-318				

① Part #24B563217 used in Models 04MD, 14MFM (Part of M1).
② Part #24B563214 used in Models 04MD, 14MFM (Part of M1)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L8	1A	.4Ω	.010 HY	25K561571-M ①					① Alternate Part # 25K561571

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	10	1	25C563595-C ①					① Alternate Part #25C563595

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	18Ω Tap ⓐ 6-8Ω	12Ω	25C563403C ①					① Alternate Part #25C563403

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6"x 9"	PM	6-8Ω	1D563032 *		* Models 14MF, 14MFM
	5"x 7"	PM	6-8Ω	50D563417 ‡		‡ Models 04MD, 14MD

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	Tuner	77D40041A02	(AT-322) Pushbutton Type, Model 14MF
	Tuner	77D40204A01	(Mat.-323) Manual Type, Model 14MFM
	Tuner	77D40204A02	(Mat.-345) Manual Type, Model 04MD
		77D40041A03	(AT-358) Pushbutton Type, Model 14MD
M2	Spark Plate	64K563410	
M3	Spark Plate	64K563410	
	Printed Board	84K564809	Less All Components (When ordering, add suffix letter to part number)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Pointer	1B562901	Model 14MF, 14MD
Dial Pointer	1B40206A01	Models 14MFM, 04MD
Dial Scale	34K564752	Models 14MFM, 14MF
Dial Scale	34K564133	Model 04MD
Pushbutton	38K564761	Model 14MF
Pushbutton	38K564625	Model 14MD
Knob	36B562701	Tuning, Volume, Models 14MF, 14MFM
Knob	36B562960	Tuning, Volume, Models 04MD, 14MD
Knob	36B562974	Tone, Dummy

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

PHOTOFACT® Folder

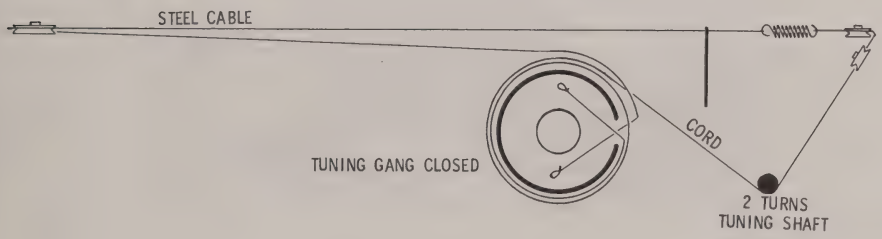
**GRUNDIG MAJESTIC
MODEL 1097U**

GRUNDIG MAJESTIC
MODEL 1097U

GRUNDIG MAJESTIC
MODEL 1097U

TRADE NAME	Grundig Majestic Model 1097U
IMPORTER	Majestic International Sales, 743 N. LaSalle Street, Chicago 10, Illinois
TYPE SET	AC Operated 6 Tube FM-BC-SW Receiver
POWER SUPPLY	110 — 120 (or) 220 Volts AC, 60 Cycles RATING 52 Watts, .5 Amp. @117 Volts AC
TUNING RANGE	BROADCAST 510 — 1620KC SHORT WAVE 5.9 — 16MC FREQ. MOD.88 —108MC

DIAL CORD STRINGING



FRONT VIEW

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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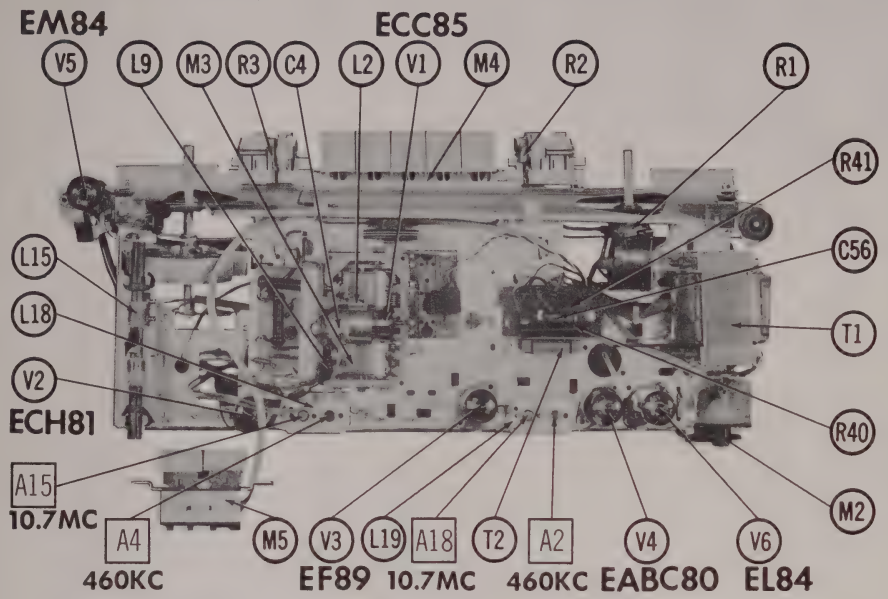
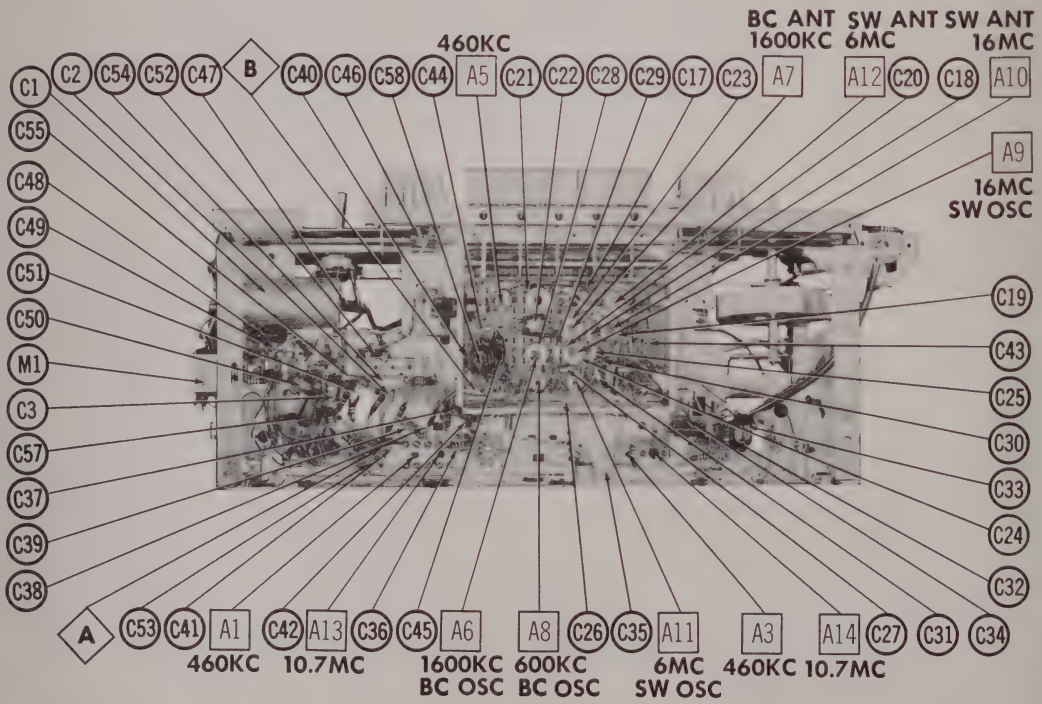
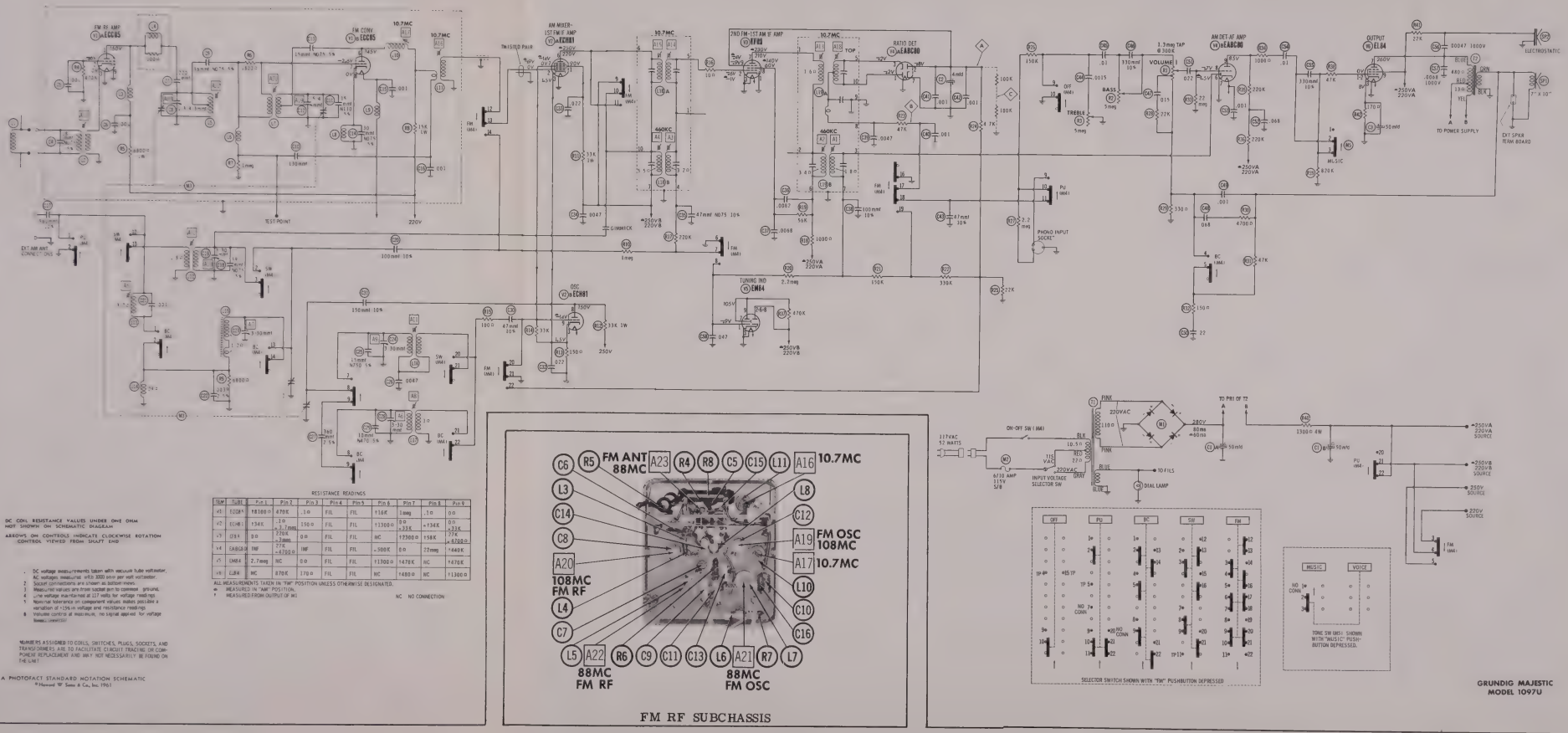


CHASSIS-TOP VIEW



CHASSIS BOTTOM VIEW-ALIGN., CAPACITOR & MISC. IDENT.



FM RF SUBCHASSIS

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
v1	ECC85	18100 Ω	470K	1.0	FIL	FIL	116K	1meg	1.0	0.0
v2	ECH81	134K	1.0 ±0.1meg	150 Ω	FIL	FIL	13300 Ω	0.0	+134K	0.0
v3	UF41	0.0	270K ±3meg	0.0	FIL	FIL	NC	12300 Ω	158K	27K ±8200 Ω
v4	EABC80	INF	27K ±4700 Ω	INF	FIL	FIL	∞300K	0.0	22meg	1440K
v5	EM84	2.7meg	NC	0.0	FIL	FIL	13300 Ω	1470K	NC	1470K
v6	EL84	NC	870K	170 Ω	FIL	FIL	NC	1480 Ω	NC	13300 Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
* MEASURED IN "AM" POSITION.
† MEASURED FROM OUTPUT OF M1
NC NO CONNECTION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured with 3000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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GRUNDIG MAJESTIC MODEL 1097U

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use only enough generator output to provide a usable indication.
Suggested Alignment Tools: A18, A19..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 2 (grid) of AM Mixer. Low side to chassis.	460KC (400~ 30% AM)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	High side thru 200mmf to AM antenna terminals. Low side to chassis.	"	"	"	A5	Adjust for MINIMUM deflection.
3.	"	1600KC	1600KC	"	A6, A7	Adjust for maximum output.
4.	"	600KC	600KC	"	A8	"
5.	"	16MC	(SW) 16MC	"	A9, A10	"
6.	"	6MC	6MC	"	A11, A12	Adjust for maximum output. Repeat Steps 2 thru 6.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM — SELECTOR IN FM POSITION

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Across FM antenna terminals.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A13, A14, A15, A16, A17	Adjust for maximum deflection.
8.	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A18	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION:

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7.	Across FM antenna terminals.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A13, A14, A15, A16, A17	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.
8.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A18	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A13 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT — SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	Across FM antenna terminals with 150Ω in each lead.	108MC (Unmod.)	(FM) 108MC	DC probe to point Ⓐ. Common to chassis.	A19, A20	Adjust for maximum deflection.
10.	"	88MC	88MC	"	A21, A22, A23	"

FIG. 1

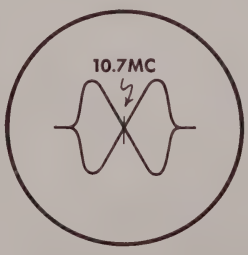


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	ECC85
V2	1st FM IF Amp. - AM Mixer-AM Osc.	ECH81
V3	2nd FM - 1st AM IF Amp.	EF89
V4	Ratio Det. -AM Det-AF Amp.	EABC80
V5	Tuning Indicator	EM84
V6	Output	EL84

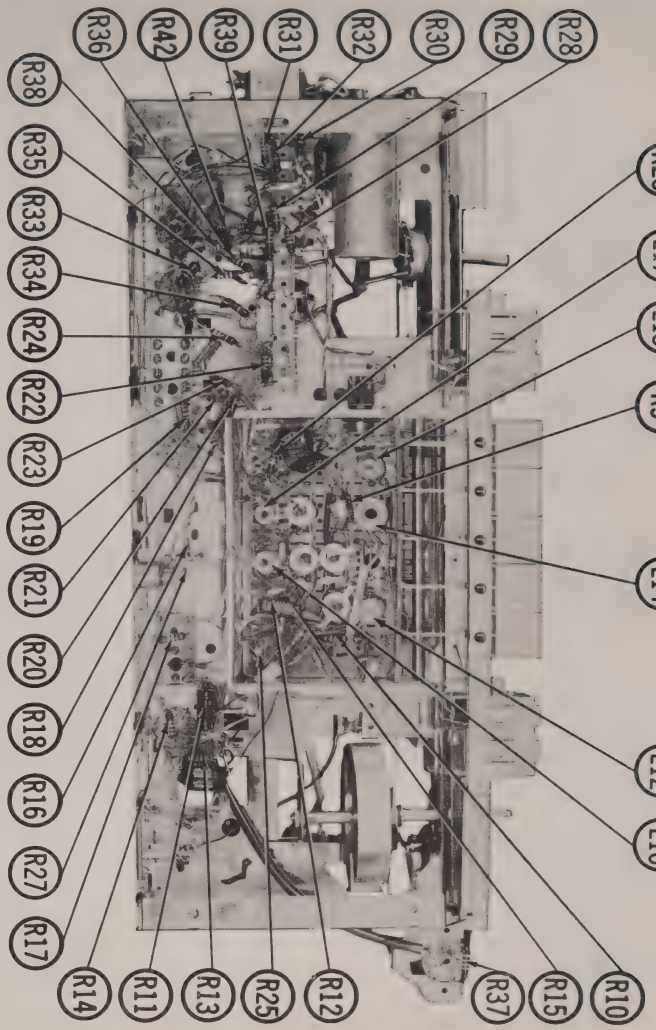
ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Grundig Majestic PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲50	350			A0390	FP137	TMS-1630	TVL-1622	
B	■50	350			BR5035	TC79	TD-50-450	TVA-1713	
C2	4	70		PRS1400	NLW4-150	TT80X4	MLV5-100	TE-1403	
C3	50	12		PTT59	NLW50-15	TT15X50	MLV50-12	TE-1133	

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	18 N075 5%					*		
C5	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C6	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C7	220		DI-220	DD-220	L10T22	CCD-221	B-322	10TS-T22
C8	1.3-9.3							
C9	36 N075 5%					*		
C10	130		SI 120	D6-121	L10T13	CCD-121	GP313	10TS-T13
C11	15 N110 5%					*		
C12	.5-4							
C13	15 N075 5%					*		
C14	30 N075 5%					*		
C15	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C16	.001		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C17	560 10%			D6-561	5R5T56	CCD-561	GP356	10TS-T56
C18	39 N075 5%					*		
C19	3-30							
C20	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C21	.001		SI 10000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C22	.0039 2.5%							
C23	3-30							
C24	3-30							
C25	15 N750 5%		N750-SI 15	TCN-15	C10Q15U	*	CN7-150	10TCU-Q15
C26	.0047		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C27	360 2.5%					VCM-20-361G		
C28	3-30							
C29	10 N470 5%					*		
C30	47 10%		NPO-SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C31	150 10%		NPO-SI 150	D6-151	L10T15	CCD-151	GP315	10TS-T15
C32	.022 250V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C33	.022 500V		P688N-022	DD-203	CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C34	.0047 500V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C35	47 N075 10%					*		
C36	.0082		SI 8200	DD-822	HVE16D8	CCD-822	B-282	BL-D80
C37	.0068 500V		P688N-0068	D6-682	CUB6D68	6DP-1-682	GEM-6268	6TM-D68
C38	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C39	.0047		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C40	.001 500V		P688N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D10
C41	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C42	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C43	47 10%		NPO-SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C44	.0015 500V		P688N-0015	D6-152	CUB6D15	6DP-1-152	GEM-6215	6TM-D15
C45	.01 250V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C46	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C47	.015 250V		P488N-015	DD16-153	CUB6S15	4DP-1-153	GEM-4115	4TM-S15
C48	.068 250V		P488N-068		CUB6S68	4DP-3-683	GEM-4168	4TM-S68
C49	.001 500V		P688N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D10
C50	.22 250V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C51	.022 250V		P488N-22	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C52	.068 250V		P488N-068		CUB4S68	4DP-3-683	GEM-4168	4TM-S68
C53	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C54	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C55	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C56	.00047 1000V			DD-471	CUB10T5	CCD-471	B-347	10TM-T50
C57	.0068 1000V		P1088N-0068	DD-682	CUB10D68	16DP-3-702	GEM-10268	10TM-D68
C58	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Grundig Majestic PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1.3meg 300K Tap	1/2	7801-146	ABT-73				Volume
B	Shaft			AK-29				
R2	5meg	1/2	7806-149					Bass
R3	5meg	1/2	7806-148					Treble

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	470K				R24	4700Ω			
R5	6800Ω 1W				R25	22K			
R6	1800Ω				R26	150K			
R7	1meg				R27	2.2meg			
R8	15K 1W				R28	22K			
R9	6800Ω				R29	330Ω			
R10	1meg				R30	4700Ω			
R11	33K 1W				R31	47K			
R12	33K 1W				R32	150Ω			
R13	150Ω				R33	22meg			
R14	33K				R34	1000Ω			
R15	100Ω				R35	220K			
R16	10Ω				R36	220K			
R17	220K				R37	470K			
R18	1000Ω				R38	47K			
R19	56K				R39	820K			
R20	2.2meg				R40	1300Ω 4W	PW4-1300	5W-SQ-1300	
R21	150K				R41	22K			
R22	330K				R42	170Ω			
R23	47K								

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Grundig Majestic PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Ant. Matching	9238-056					① Wound on 100Ω
L2	FM Ant.	BV1974					
L3	RF Choke	BV1975					
L4	RF Choke	BV1956 ①					
L5	FM RF	9208-25					
L6	RF Choke	BV1976					
L7	FM Osc.	9208-024					
L8	RF Choke	BV1950					
L9	Fil. Choke	BV1833					
L10	FM Mixer Plate	BV1977					
L11	1st FM IF	BV1978					
L12	SW Ant.	9232-001					
L13	460KC Trap	9208-057					
L14	RF Choke	9208-001					
L15	Loopstick	9233-052					
L16	SW Osc.	9232-002					
L17	BC Osc.	9208-102					

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Grundig Majestic PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L18A	2nd FM IF	7207-308					
B	1st AM IF						
L19A	Ratio Det.	7207-328					
B	2nd AM IF						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	Grundig Majestic PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	220V Tap ② 117V ② .5A	220V ④ .150A AC	6.3V ④ 2.3A	9078-071					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Grundig Majestic PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8400Ω Tap ④ 3%	2-3Ω	9054-019					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Grundig Majestic PART No.	QUAM PART No.	
SP1	7"x 10"	PM	2-3Ω	7045-007		
SP2	Electrostatic			787-001		

POWER RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	Grundig Majestic PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.080A	B250C75				Bridge Type - Selenium

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Grundig Majestic PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2		6/10A 115V S/B	*				GMA 7/10	
		3/10A 220A S/B	†					

* 110V Line.
† 220V Line.

MISCELLANEOUS

ITEM No.	PART NAME	Grundig Majestic PART No.	NOTES
M3	Tuning Cap.	9653-411	4 Gang
M4	Switch		Function Selector (Pushbutton Type)
M5	Switch	7612-005	Music-Voice (Pushbutton Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

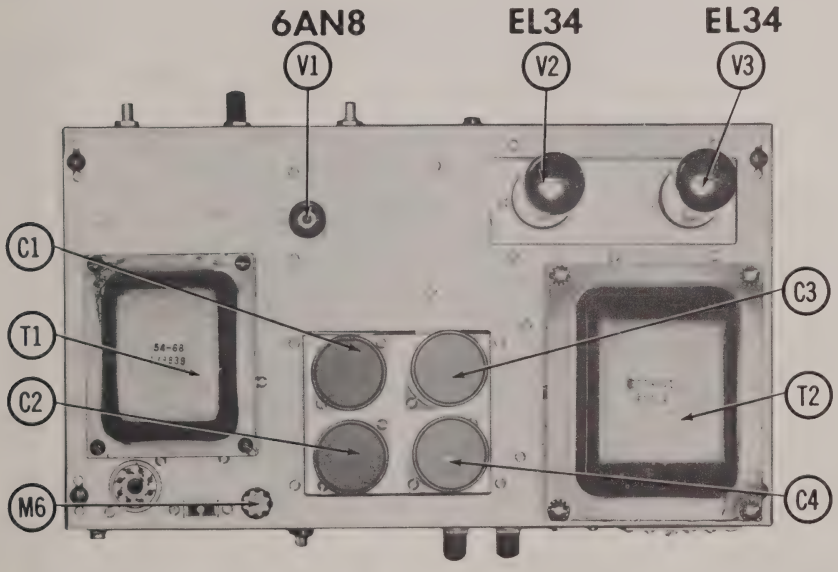
PHOTOFACT® Folder

HEATH MODELS W-7A, W-W-7A

HEATH MODELS
W-7A, W-W-7A

TRADE NAME	Heath Models W-7A (Kit), W-W-7A (Wired)
MANUFACTURER	Heath Co., A Subsidiary of Daystrom, Inc., Benton Harbor, Michigan
TYPE SET	AC Operated 3 Tube Audio Amplifier
POWER SUPPLY	110 — 120 Volts AC, 60 Cycles RATING 90 Watts, 1 Amp. @117 Volts AC

HEATH MODELS
W-7A, W-W-7A



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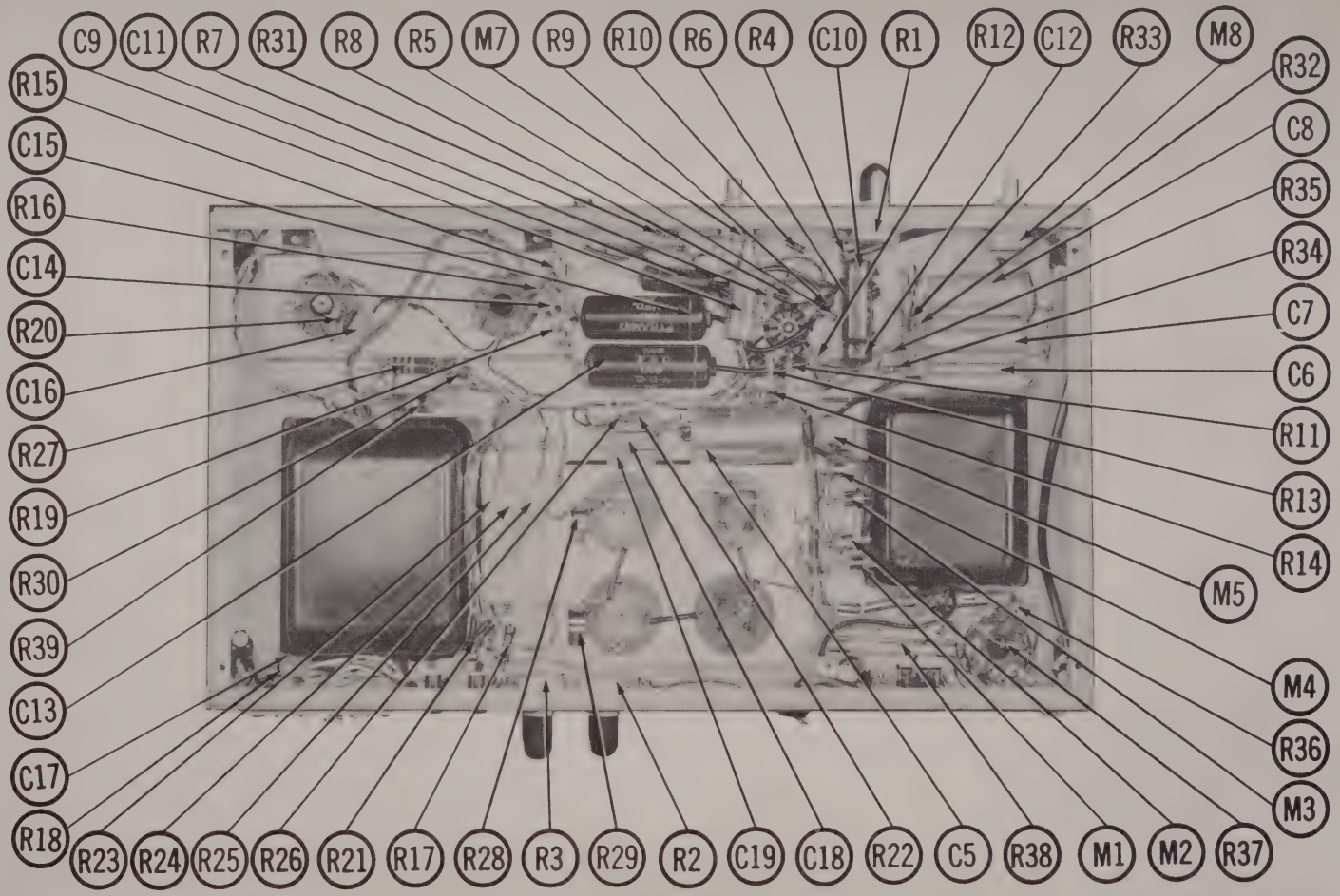
SET 546 FOLDER 10



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	GENERAL ELECTRIC • RAYTHEON • SYLVANIA • TYPE
V1	AF Amp. -Phase Inv.	6AN8
V2	Output	EL34/6CA7
V3	Output	EL34/6CA7

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	HEATH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	150	300	25-50	AFHS1-37-25	XA0355	FP140.6	TMS-1570	TVL-1584	
C2	150	300	25-50	AFHS1-37-25	XA0355	FP140.6	TMS-1570	TVL-1584	
C3	200	300	25-51	AFHS1-37-30		WP132	TMS-1580	TVLS-1586*	
C4	200	300	25-51	AFHS1-37-30		WP132	TMS-1580	TVLS-1586*	
C5	20	450	25-33	PRS1735	BR2045	TC75	TD-20-450	TVA-1709	
C6	20	150	25-19	PRS1440	BBR20-150	TC45	TD-20-150	TVA-1410	
C7	100	50	25-28	PRS1360	BR1005	TC3501	TD-100-50	TVA-1310	
C8	100	50	25-28	PRS1360	BR1005	TC3501	TD-100-50	TVA-1310	
C9	25	25	25-44	PRS1260	BBR25-25	TC26	TD-25-25	TVA-1205	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C11	.05 600V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C12	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C13	.25 600V		P688N-25		CUB6P25	6DP-5-254	GEM-6025	6TM-P25
C14	200		1469-0002	TCZ-200	22R5T2	CM-19B-201M	MC237	1FM-320
C15	.25 600V		P688N-25		CUB6P25	6DP-5-254	GEM-6025	6TM-P25
C16	200		1469-0002	TCZ-200	22R5T2	CM-19B-201M	MC237	1FM-320
C17	.05		BPD-05	DD-503	H-05S5	DP-2-503	GP150	5HK-S50
C18	.0013 5%		1464-0013		1R5D13	CM-19B-132J		MS-213
C19	.0013 5%		1464-0013		1R5D13	CM-19B-132J		MS-213

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	HEATH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	10-74	B-60	A47-500K-Z	Q13-133	U48	Gain
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R2A	15K	½	10-85	B-20	A47-15K-S	B11-118	RU153L *	Bias Voltage Adj.
B	Shaft			Not Req.	FKS-1/4	SK-6	SL3500*	
R3A	20K	½	10-73	B-22	A47-20K-S	Q11-119	U26	Balance
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

* Use bushing SL-38.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	47K			
R5	33K			
R6	1meg			
R7	330K			
R8	1.5meg			
R9	680Ω			
R10	100Ω			
R11	1meg			
R12	22K 1W			
R13	2700Ω			
R14	22K 1W			
R15	100K			
R16	22K			
R17	6Ω 1%			
R18	47Ω 1W			
R19	100K			
R20	22K			
R21	6Ω 1%			
R22	1500Ω			
R23	0.17Ω 5% 5W			
R24	0.09Ω 5% 5W			
R25	0.15Ω 5% 5W			
R26	1500Ω			
R27	6800Ω 2W			
R28	100K 2W			
R29	100K 2W			

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R30	15K 1W			
R31	470K			
R32	12K			
R33	12K			
R34	4700Ω			
R35	4700Ω			
R36	10K			
R37	10K			
R38	100Ω			
R39	100K 2W			

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	HEATH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V@ 1A	180V@ .5A AC	40V@ .002A DC	54-68					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V@ 3.5A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	HEATH PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4000Ω CT Tap@ 900Ω CT	70V Tap@ 16Ω, 8Ω, 4Ω	51-36					

POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	HEATH PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.110A		1N1763	40H	SR500	
M2	.110A		1N1763	40H	SR500	
M3	.110A		1N1763	40H	SR500	
M4	.110A		1N1763	40H	SR500	
M5	.002A		1N1763	50	SR200	

FUSES

ITEM No.	TYPE	RATING	HEATH PART No. FUSE	HEATH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M6	3AG	2A 125V S/B			313002 (3AG 2A 125V) S/B	342001	MDL2	HKP

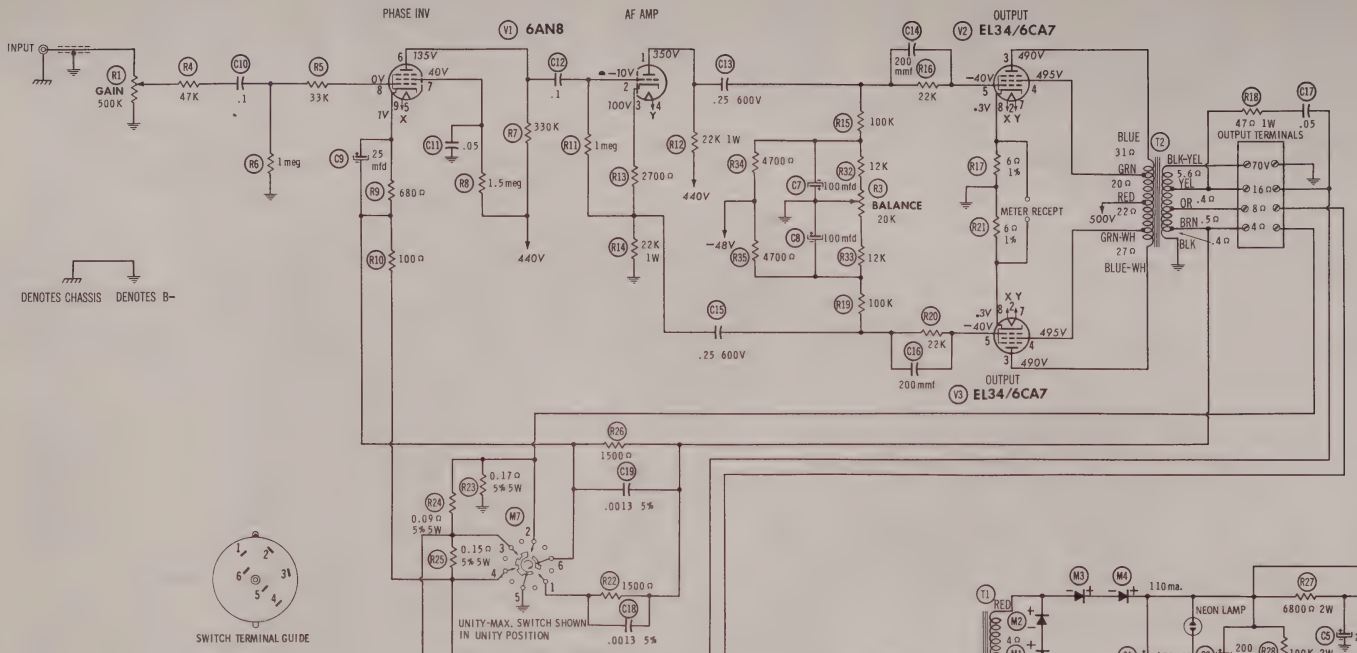
MISCELLANEOUS

ITEM No.	PART NAME	HEATH PART No.	NOTES
M7	Switch		Damping Selector (Rotary Type)
M8	Switch		Power Off-On (Rotary, Snap Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AN8	†29K	1meg	25K	FIL	FIL	†330K	†1.5meg	1meg	780Ω
V2	EL34 6CA7	TP	FIL	†50Ω	†20Ω	140K	NC	FIL	6Ω	
V3	EL34 6CA7	TP	FIL	†50Ω	†22Ω	140K	TP	FIL	6Ω	

† MEASURED FROM OUTPUT OF M4. NC NO CONNECTION TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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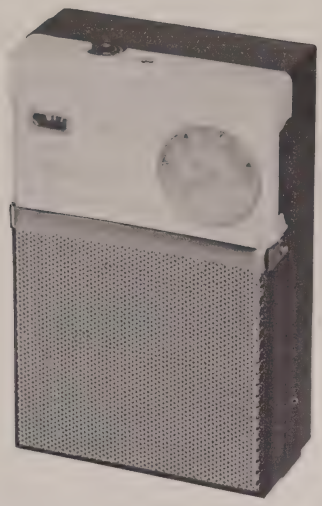
HEATH MODELS W-7A, W-W-7A

PHOTOFACT® Folder with CIRCUITRACE®

MARVEL MODEL 6YR-05

MARVEL MODEL 6YR-05



TRADE NAME	Marvel Model 6YR-05
IMPORTER	Concord Overseas, 15 Moore Street, New York, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC RATING 6MA @ 9 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST 540 – 1600KC	15MA @ 9 Volts DC (Signal, Normal Volume)

MARVEL MODEL 6YR-05

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3.....GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A4, A6.....GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	"
3.	"	600KC	600KC	"	A5	"
4.	"	1400KC	1400KC	"	A6	Adjust for maximum output. Repeat Steps 2, 3 and 4.

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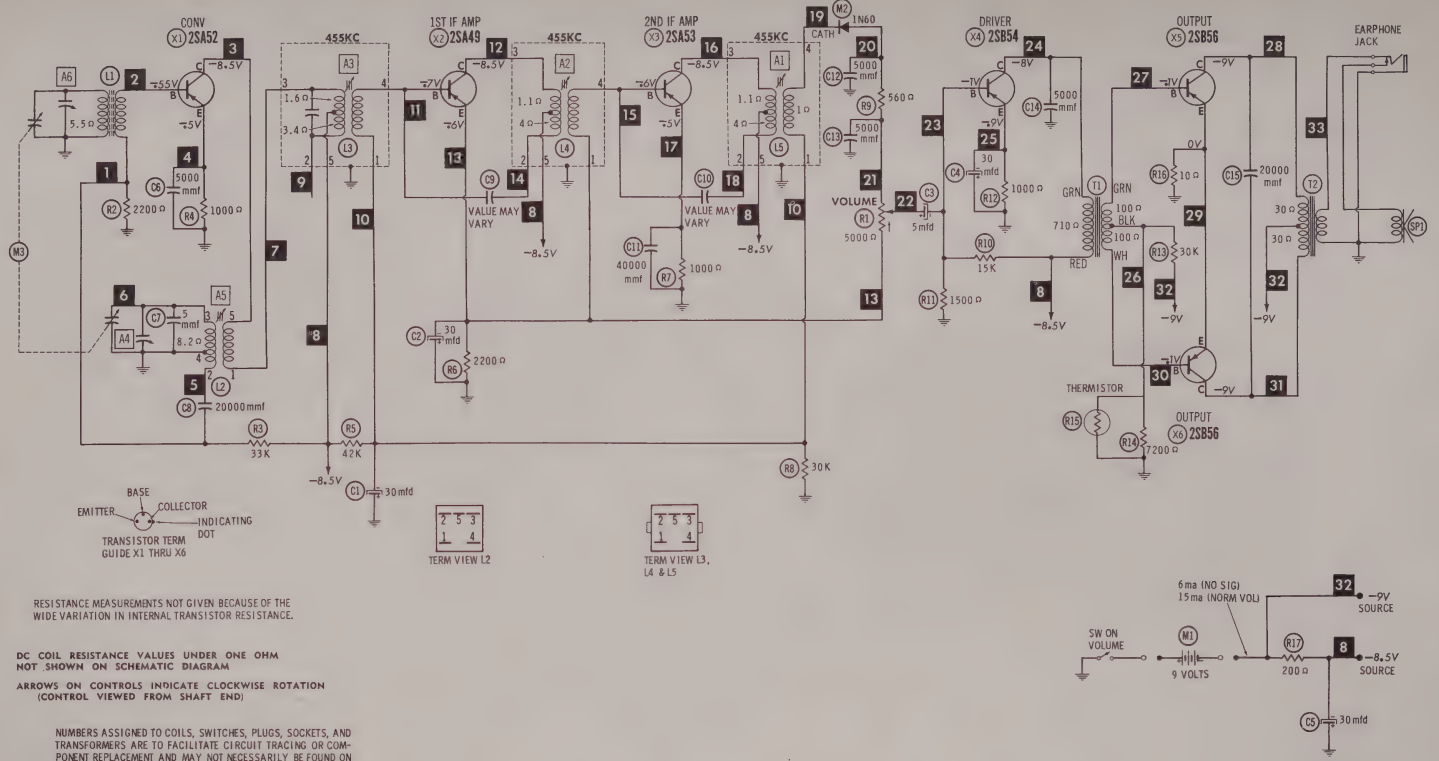
KF685

SET 546 FOLDER 11



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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MARVEL MODEL 6YR-05

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2SA52	Converter		2N486		PNP
X2	2SA49	1st IF Amplifier	2N410	2N483		PNP
X3	2SA53	2nd IF Amplifier	2N410	2N483		PNP
X4	2SB54	Driver	2N406	2N362		PNP
X5	2SB56	Output	2N408	2N632		PNP
X6	2SB56	Output	2N408	2N632		PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MARVEL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	30	3		PTT10	NLW30-6	TT6X30	MLV30-6	TE-1092	
C2	30	3		PTT10	NLW30-6	TT6X30	MLV30-6	TE-1092	
C3	5	3		PTT4	NLW5-15	TT6X5	MLV5-3	TE-1052.2	
C4	30	3		PTT10	NLW30-6	TT6X30	MLV30-6	TE-1092	
C5	30	6		PTT27	NLW30-6	TT6X30	MLV30-6	TE-1092	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	5000		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C7	5							
C8	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C9		Note 1						
C10		Note 1						
C11	40000							
C12	5000		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C13	5000		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C14	5000		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C15	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20

Note 1. Value Varies. Replace with original value.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MARVEL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4						Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R2	2200Ω			
R3	33K			
R4	1000Ω			
R5	42K			
R6	2200Ω			
R7	1000Ω			
R8	30K			
R9	560Ω			

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R10	15K			
R11	1500Ω			
R12	1000Ω			
R13	30K			
R14	7200Ω			
R15	Temp. Comp.			
R16	10Ω			
R17	200Ω			

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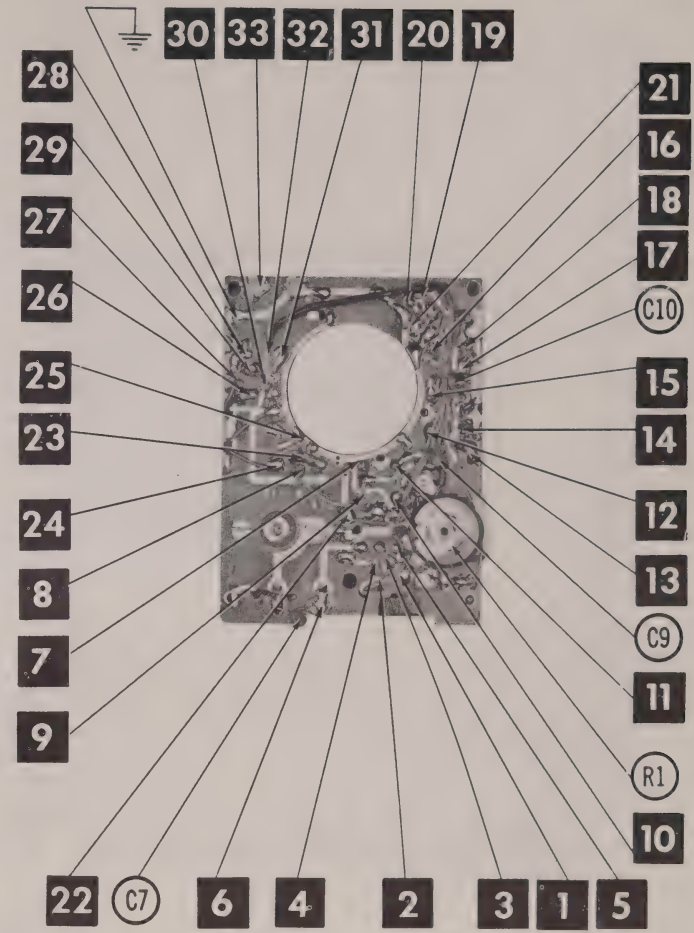


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MARVEL PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick						
L2	Osc.						
L3	1st IF						
L4	2nd IF						
L5	3rd IF						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MARVEL PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.4	1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MARVEL PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	500Ω CT	6-8Ω	M6-T2		TA-21	TR-102		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MARVEL PART No.	QUAM PART No.	
SP1	2 1/4"	PM	6-8Ω			

BATTERIES

ITEM No.	VOLTAGE	MARVEL PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	006P		2U6		216		M-6604	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		MARVEL PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60			1N60	1N60	Detector

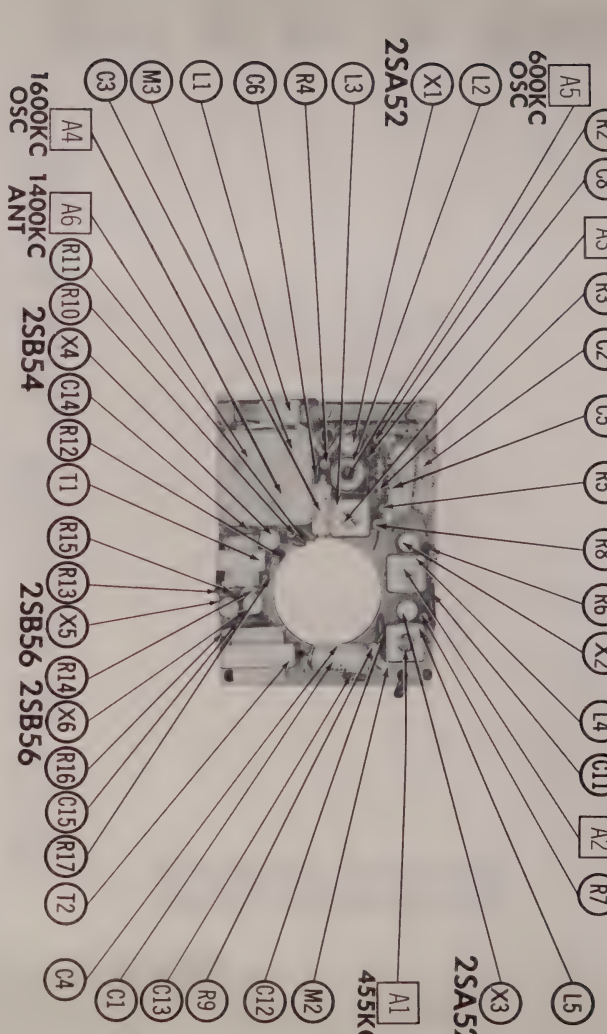
MISCELLANEOUS

ITEM No.	PART NAME	MARVEL PART No.	NOTES
M3	Tuning Cap.		2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

MELODIC
MODEL MT-69

MELODIC
MODEL MT-69

MELODIC
MODEL MT-69

TRADE NAME	Melodic Model MT-69
IMPORTER	Longwood Radio Distributors, Inc., 1261 Broadway, Suite 704, New York 1, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC RATING 7MA @ 9 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540 – 1600KC 10MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A5.... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A4, A6..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	"
3.	"	600KC	600KC	"	A5	"
4.	"	1400KC	1400KC Signal.	"	A6	Adjust for maximum output. Repeat Steps 2, 3 and 4.

SET 546 FOLDER 12

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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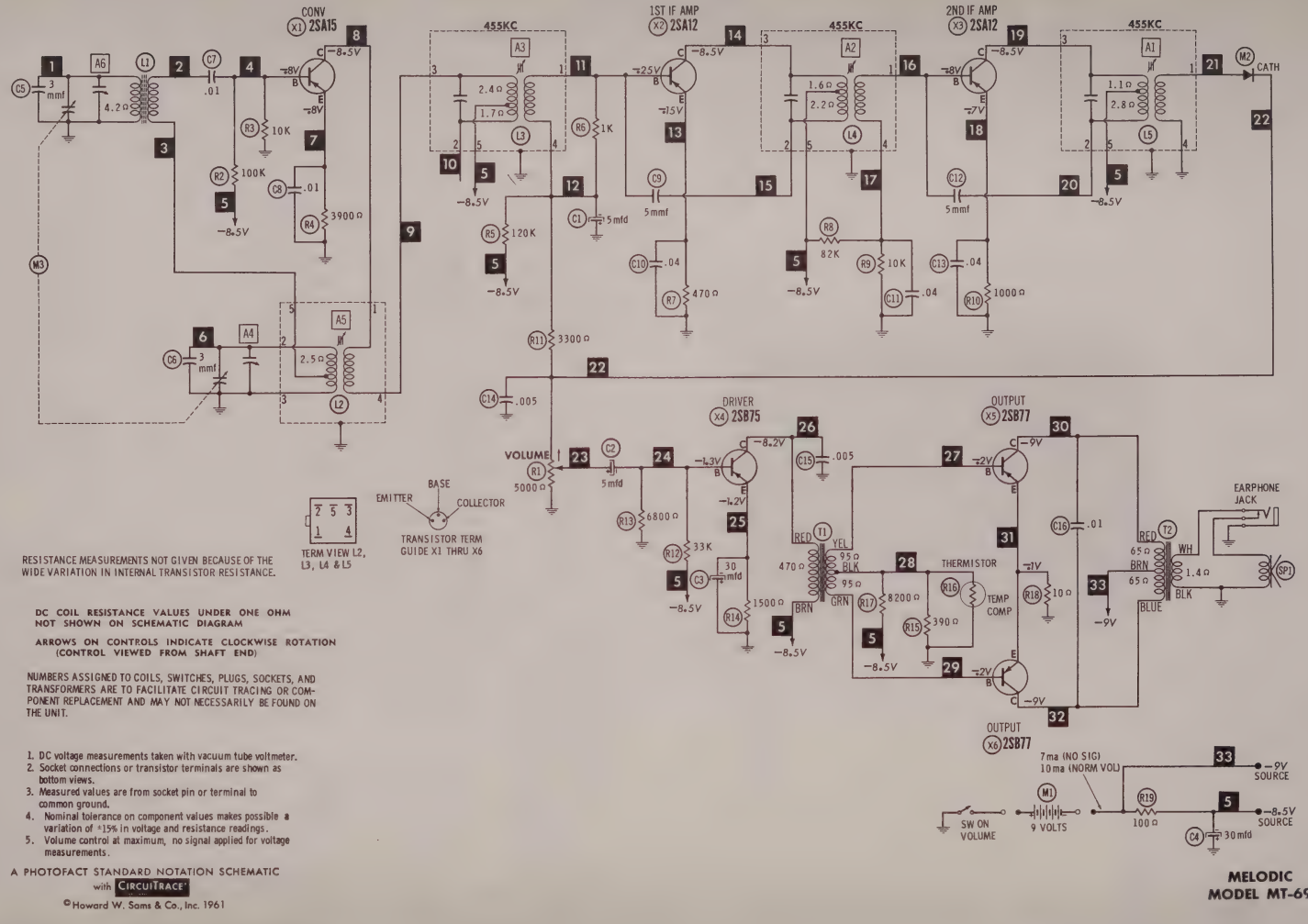

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE™

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MELODIC MODEL MT-69

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2SA15	Converter				PNP
X2	2SA12	1st IF Amplifier				PNP
X3	2SA12	2nd IF Amplifier				PNP
X4	2SB75	Driver	2N406			PNP
X5	2SB77	Output	2N408			PNP
X6	2SB77	Output	2N408			PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MELODIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	5	3		PTT4	NLW5-15	TT6X5	MLV5-3	TE-1052.2	
C2	5	3		PTT4	NLW5-15	TT6X5	MLV5-3	TE-1052.2	
C3	30	3		PTT10	NLW30-6	TT6X30	MLV30-6	TE-1092	
C4	30	10		PTT43	NLW30-15	TT15X30	MLV25-10	TE-1158	

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	3		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C6	3		NPO-DI 3.0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C7	.01		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C8	.01		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C9	5		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C10	.04							
C11	.04							
C12	5		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C13	.04							
C14	.005		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C15	.005		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C16	.01		C80V103AM	DM-103	H-05S1		TA-110	TG-S10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MELODIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/10						Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	100K				R11	3300Ω			
R3	10K				R12	33K			
R4	3900Ω				R13	6800Ω			
R5	120K				R14	1500Ω			
R6	1000Ω				R15	390Ω			
R7	470Ω				R16	Temp. Comp.			
R8	82K				R17	8200Ω			
R9	10K				R18	10Ω			
R10	1000Ω				R19	100Ω			

PRINTED BOARD

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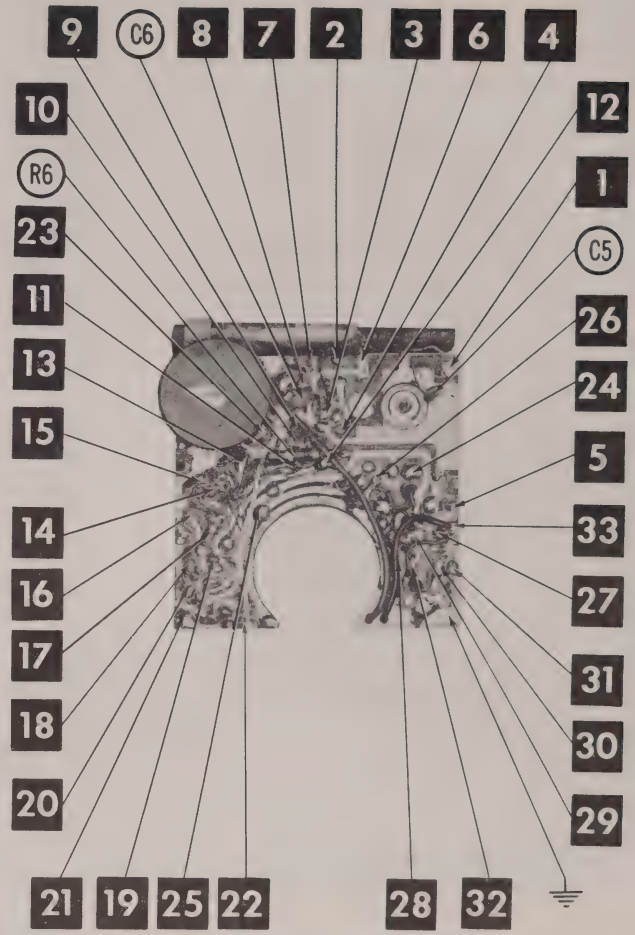


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MELODIC PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick						
L2	Oscillator						
L3	1st IF						
L4	2nd IF						
L5	3rd IF						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MELODIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.7	1		A-2763				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MELODIC PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1000Ω CT	6-8Ω						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MELODIC PART No.	QUAM PART No.	
SP1	2"	PM	6-8Ω			

BATTERIES

ITEM No.	VOLTAGE	MELODIC PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	006P		2U6		216		M-1604	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		MELODIC PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2				1N60	1N60	Detector (Pigtail)

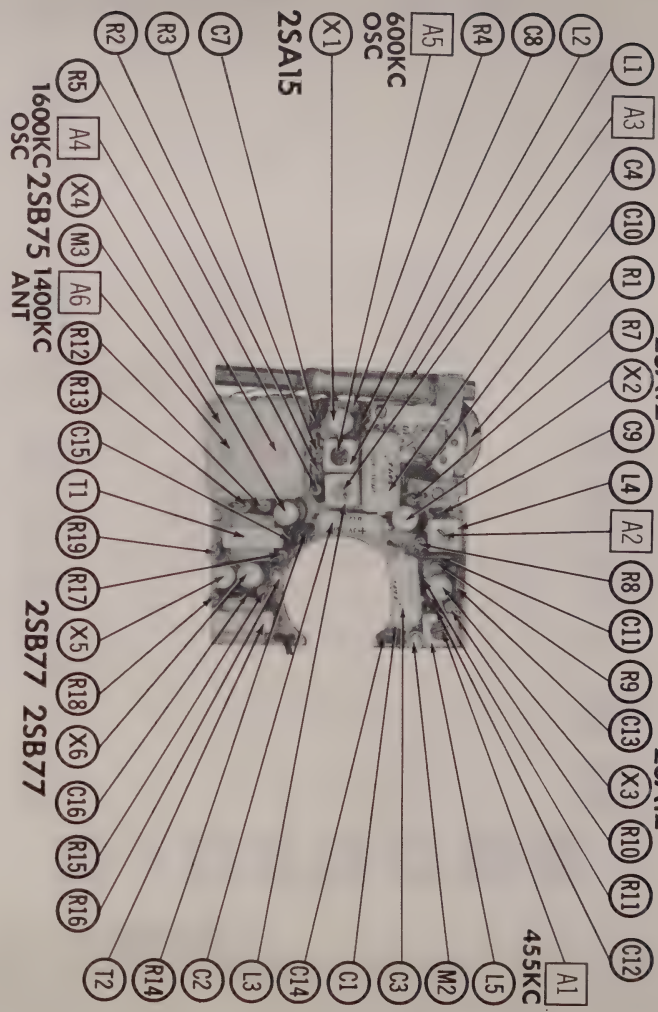
MISCELLANEOUS

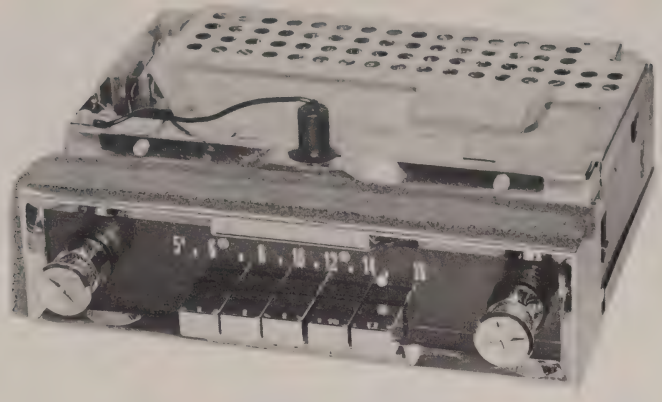
ITEM No.	PART NAME	MELODIC PART No.	NOTES
M3	Tuning Cap.		2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW





MOPAR
MODEL 107

TRADE NAME	Mopar Model 107 (12B) For 1961 Dodge Dart
MANUFACTURER	The Bendix Corp., Bendix Radio Div., Baltimore 4, Maryland
TYPE SET	Battery Operated 2 Tube - 2 Transistor Custom Built Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery RATING 1.1 Amp. @12 Volts DC
TUNING RANGE—BROADCAST	530 — 1605KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A8, A9, A10..... GENERAL CEMENT #8271, 8279, 8897
WALSCO #2521, 2524

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	262.5KC (400% Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Antenna receptacle thru dummy (Fig. 1).	1605KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless tuner has been tampered with or components replaced. If necessary, back tuning cores out of coils. Repeat Step 2.					
3.	Antenna receptacle thru dummy (Fig. 1).	1000KC	Tuner carriage $\frac{1}{8}$" from high end stop.	Across voice coil.	A8, A9, A10	Adjust for maximum output. Repeat Steps 2 and 3.
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1600KC and adjust A7 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Pull Pushbutton out.
2. Tune manually to desired station.
3. Press Pushbutton in firmly.
4. Repeat for remaining Pushbuttons.

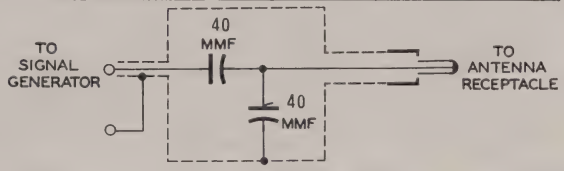


FIG. 1

MOPAR
MODEL 107

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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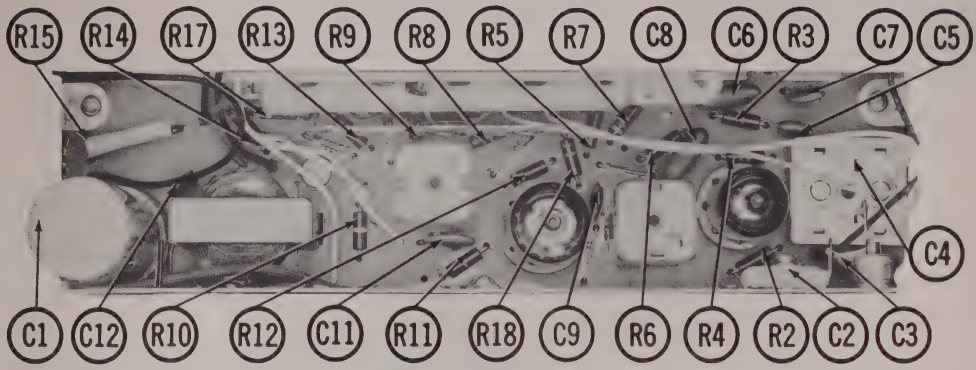
KD810



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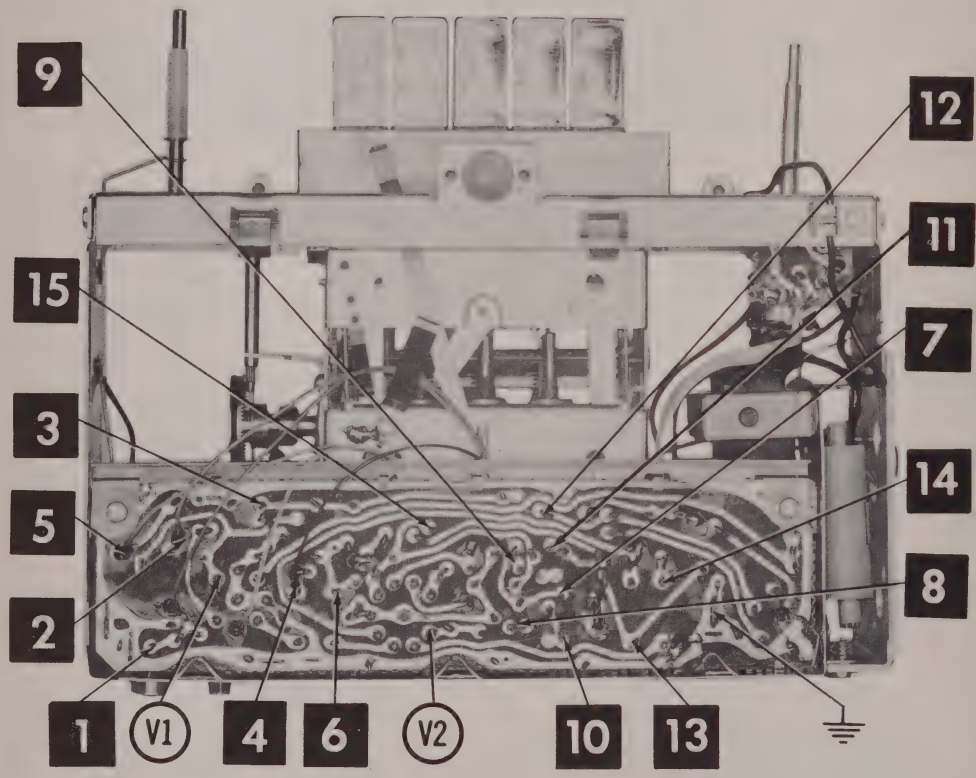

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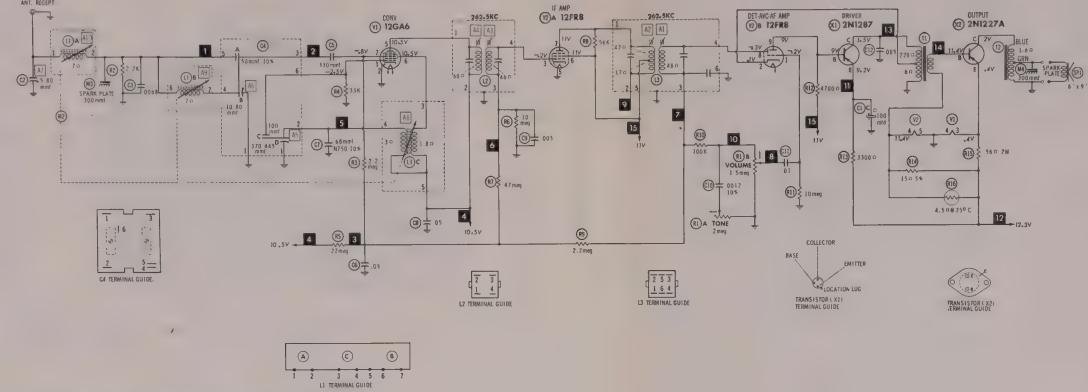
CHASSIS BOTTOM VIEW

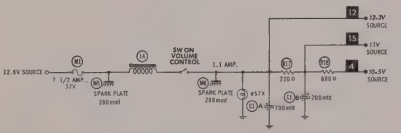
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



RESISTANCE READINGS

Item	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12GA6	33K	0 Ω	5 Ω	0 Ω	850 Ω	102 Ω	5.5 meg		
V2	12FR8	10 meg	6 Ω	8 meg	5 Ω	0 Ω	220 Ω	250 Ω	1.4 meg	

TRANSISTOR CIRCUIT RESISTANCE FOR X1 AND X2 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END).

1. DC voltage measurements taken with vacuum tube voltmeter
2. Socket connections shown as bottom views
3. Measured values are from socket pin to common ground.
4. Battery voltage maintained at 12.6 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

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MOPAR MODEL 107

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Converter	12GA6	V2	IF Amp.-Det.-AVC-AF Amp.	12FR8

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1287	Driver	2N591	2N362		PNP
X2	2N1227A	Output	2N301			PNP Note 1

Note 1. When replacing, apply silicone grease to both sides of insulator. Tighten mounting screws securely.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	BENDIX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	700	16	220353-21	PWH3-00-95.6				PCLS-3021.8*	
B	▲200	16							
C	■100	16							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	5-80	#219083-3				462		
C3	.0068 100V		P288N-0068	D6-682	BYA10D68	IDP-1-682	GEM-6268	6TM-D68
C4A	50 10%		NPO-DI 50	DTZ-50	C10Q50C	CCTO-510	CNO-450	10TCC-Q50
B	10-80	#219092-15						
C	100		NPO-DI 100	DTZ-100	C10T1C	CCTO-101	CNO-310	10TCC-T10
D	370-445							
C5	330		DI-330	DD-331	L10T33	CCD-331	B-333	10TS-T33
C6	.05 100V		P288N-05	DD-503	CUB2S5	IDP-2-503	GEM-415	2TM-S50
C7	68 N750 10%		N750-DI 68	DTZ-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C8	.05 100V		P288N-05	DD-503	CUB2S5	IDP-2-503	GEM-415	2TM-S50
C9	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C10	.0012 10%		DI-1200	DD-122	5R5D12	CCD-122	GP212	10TS-D12
C11	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	.005		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50

Bendix Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BENDIX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg		2091339-4					Tone
B	1.5meg							Volume
C	Switch							Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	2200Ω				R11	10meg			
R3	2.2meg				R12	4700Ω			
R4	33K				R13	330Ω			
R5	22meg				R14	15Ω 5%			
R6	10meg				R15	.56Ω 2W			Pt. #2090948-15
R7	47meg				R16	4.5Ω@25°C			Pt. #220629-11
R8	56K				R17	220Ω			
R9	2.2meg				R18	680Ω			
R10	100K								

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		BENDIX PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1A	Ant.	2090131-27 ①					① Part of M2.
B	RF						
C	Osc.						
L2	Input IF	2090907-9	BC-344	13-PH1	RTC-8644	T655	
L3	Output IF	2090908-7					

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	BENDIX PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L4	1.1A	.26Ω	1200 uH	2091107-2					

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	BENDIX PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	7	1	2090433-4					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA					NOTES
	PRI.	BENDIX PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	200Ω Tap @ 3-4Ω	2090849-9					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	BENDIX PART No.	QUAM PART No.	
SP1	6"x 9"	PM	3-4Ω	2091269-1	69A3	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BENDIX PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A 32V		221633-12 * 221633-3 †	30707.5 (SFE 7½A 32V)	155009	SFE 7½	HRH

* Includes Connector Assembly.
† Cap.

MISCELLANEOUS

ITEM No.	PART NAME	BENDIX PART No.	NOTES
M2	Tuner	2091576-4	Includes Pushbuttons, Less Pointer
M3	Spark Plate	220267-12	300mmf
M4	Spark Plate	220267-12	300mmf
M5	Spark Plate	220267-18	280mmf
M6	Spark Plate	220267-18	280mmf

CABINETS & CABINET PARTS

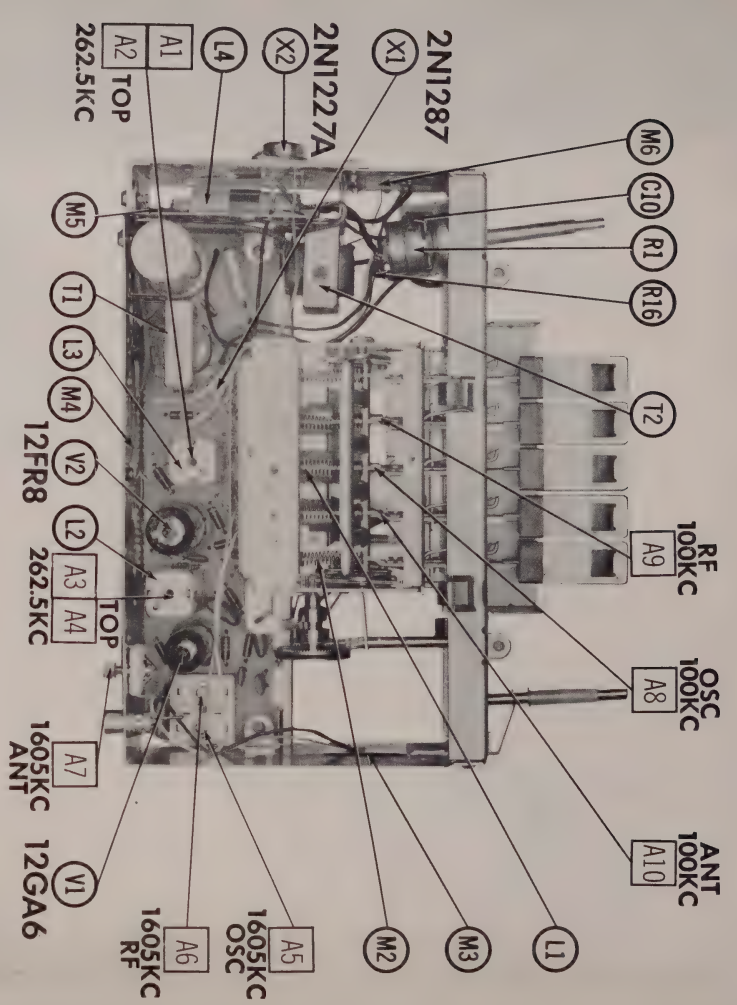
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	2091716-1	
Dial Pointer	2091077-1	
Pushbutton	2091204-1	
Knob	2091134-2	Tuning, Volume
Knob	2091135-3	Tone, Dummy

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661

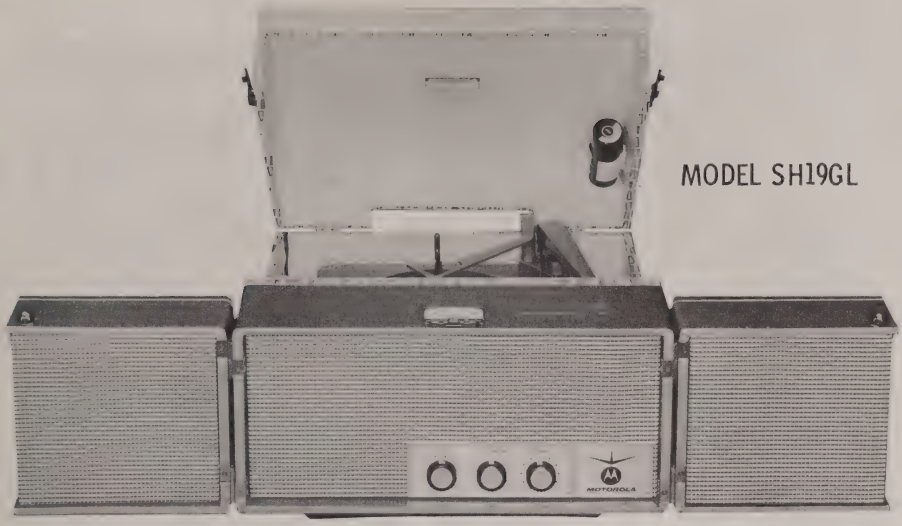
CHASSIS—TOP VIEW



PHOTOFACT® Folder

MOTOROLA MODELS SH19B, SH19GL (Ch. HS-861, HS-869)

MOTOROLA MODELS SH19B, SH19GL (Ch. HS-861, HS-869)

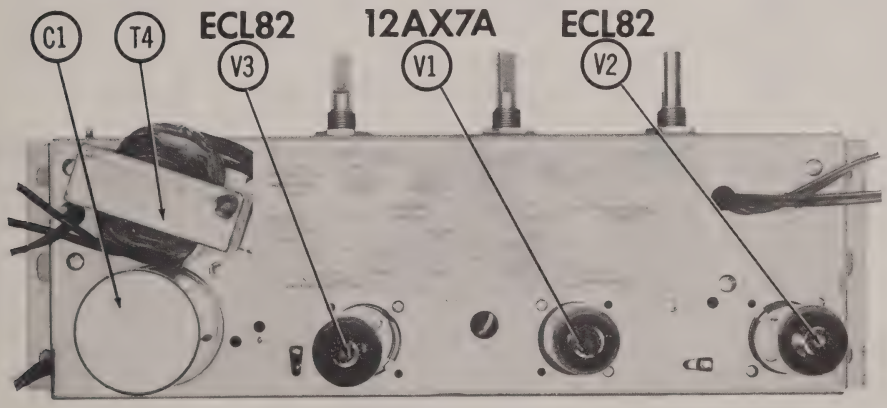


MODEL SH19GL

MOTOROLA MODELS SH19B, SH19GL (Ch. HS-861, HS-869)

TRADE NAME	Motorola Models SH19B, SH19GL (Ch. HS-861, HS-869)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles RATING 37 Watts, .36 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER VM35RC – SEE SIMILAR V-M 1571 – PHOTOFACT SET 527 FOLDER 14



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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SET 546 FOLDER 14

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆			RAYTHEON ◆	SYLVANIA ◆	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7A	V3	Right Channel AF Amp. - Right Channel Output	ECL82/6BM8
V2	Left Channel AF Amp. - Left Channel Output	ECL82/6BM8	V4	Rectifier	EZ80/6V4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲50	250	23K645880	AFH4-02-45	D0044	FP425 .1	TMQ-4322	TVL-4641	
B	■80	250							
C	20	250							
D	▲10	250							

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C3	.005 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C4	.005 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C5	.0033 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C6	.005 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C7	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10
C9	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C10	.005 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C11	.005 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C12	.0033 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C13	.005 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C14	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P10

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg 600K Tap	½	18D60116A03	BT-174 †			FB26T75	Loudness, Left Channel
B	2meg 600K Tap	½		STR-174 †			RU26T75	Loudness, Right Channel
C	Shaft			Not Req.			CS3500	
R2A	1meg	½	18D60116A05	B-68			FA16R	Tone, Right Channel
B	1meg	½		SR-68			RU16R	Tone, Left Channel
C	Shaft			Not Req.			CS3500	
R3	700K *	½	18D60116A02					Balance

* Tap and Stop at 105K & 595K.
† Use 500K Tap.

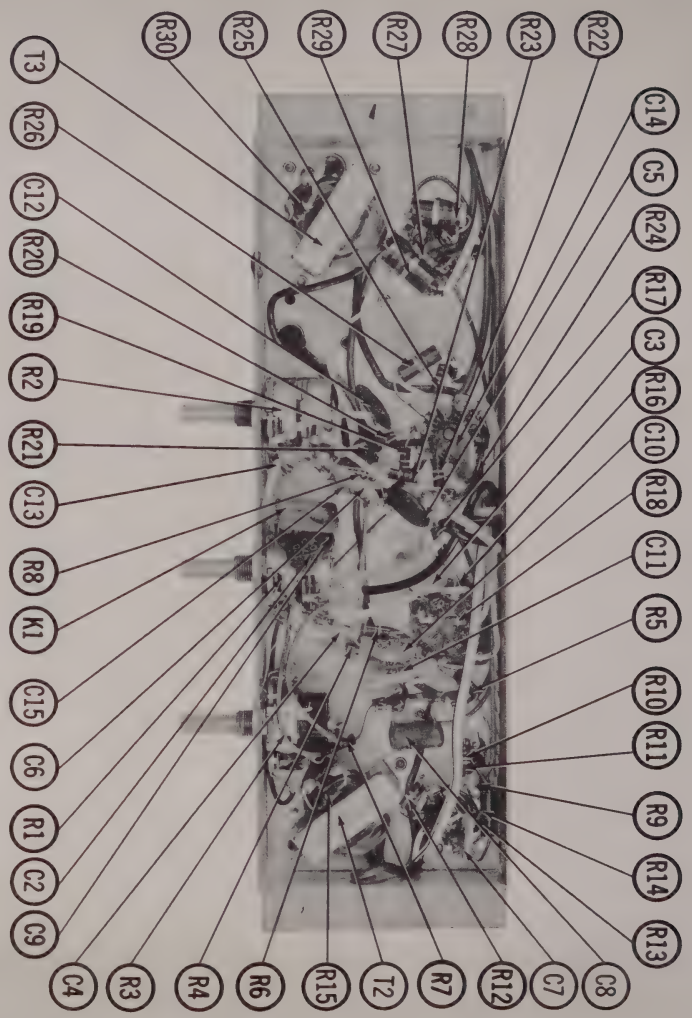
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R4	1.2meg			
R5	220K			
R6	820Ω			
R7	100K			
R8	33K			
R9	1meg			
R10	220K			
R11	2200Ω			
R12	820K			
R13	680K			
R14	270Ω 1W			
R15	100Ω			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R16	1.2meg			
R17	220K			
R18	820Ω			
R19	100K			
R20	33K			
R21	1meg			
R22	220K			
R23	2200Ω			
R24	820K			
R25	680K			
R26	270Ω 1W			
R27	6800Ω			

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R28	4700Ω 2W				R30	100Ω			
R29	120Ω 2W								

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K1	Loudness Comp.	2000mmf, 2000mmf, 68K, 68K	51B644164	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V @ .36A	380VCT @ .070A DC	6.3V @ .6A	25C60436A01					
	SEC. 3	SEC. 4	SEC. 5						
	6.3V @ 1.5A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4000Ω	6-8Ω	25B60373A01	A-2900	A-3856	24S04	S-41X	
T3	4000Ω	6-8Ω	25B60373A01	A-2900	A-3856	24S04	S-41X	
T4	2300Ω CT	6-8Ω	25B6039IA01					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	5"	PM	6-8Ω	50K647083	5A1Z8	
SP2	5"x 7"	PM	6-8Ω	50C60459A01	57A21Z8	
SP3	5"	PM	6-8Ω	50K647083	5A1Z8	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1A 125V P/T	65K646113		315001 (3AG 1A 125V P/T)		MDV 1	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	REPLACEMENT DATA								NOTES
	MOTOROLA PART No.		ASTATIC PART No.		ELECTRO-VOICE PART No.		SONOTONE PART No.		
	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	CARTRIDGE	NEEDLE*	
M2	59C60335A01	59C60336A04* (LP) ①	17	Not Req.	26S	S1-1 *	8TA4-S	N-8TA-S*	① Alternate Part # 59C60336A05
		59C60336A03* (78RPM)				S3-3 *			

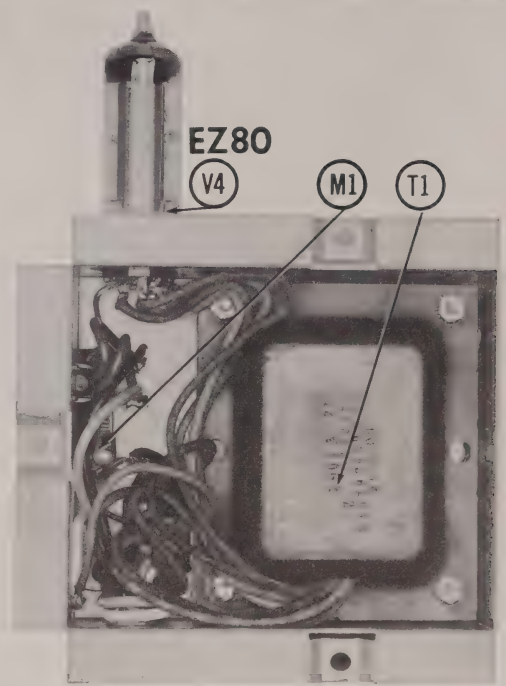
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

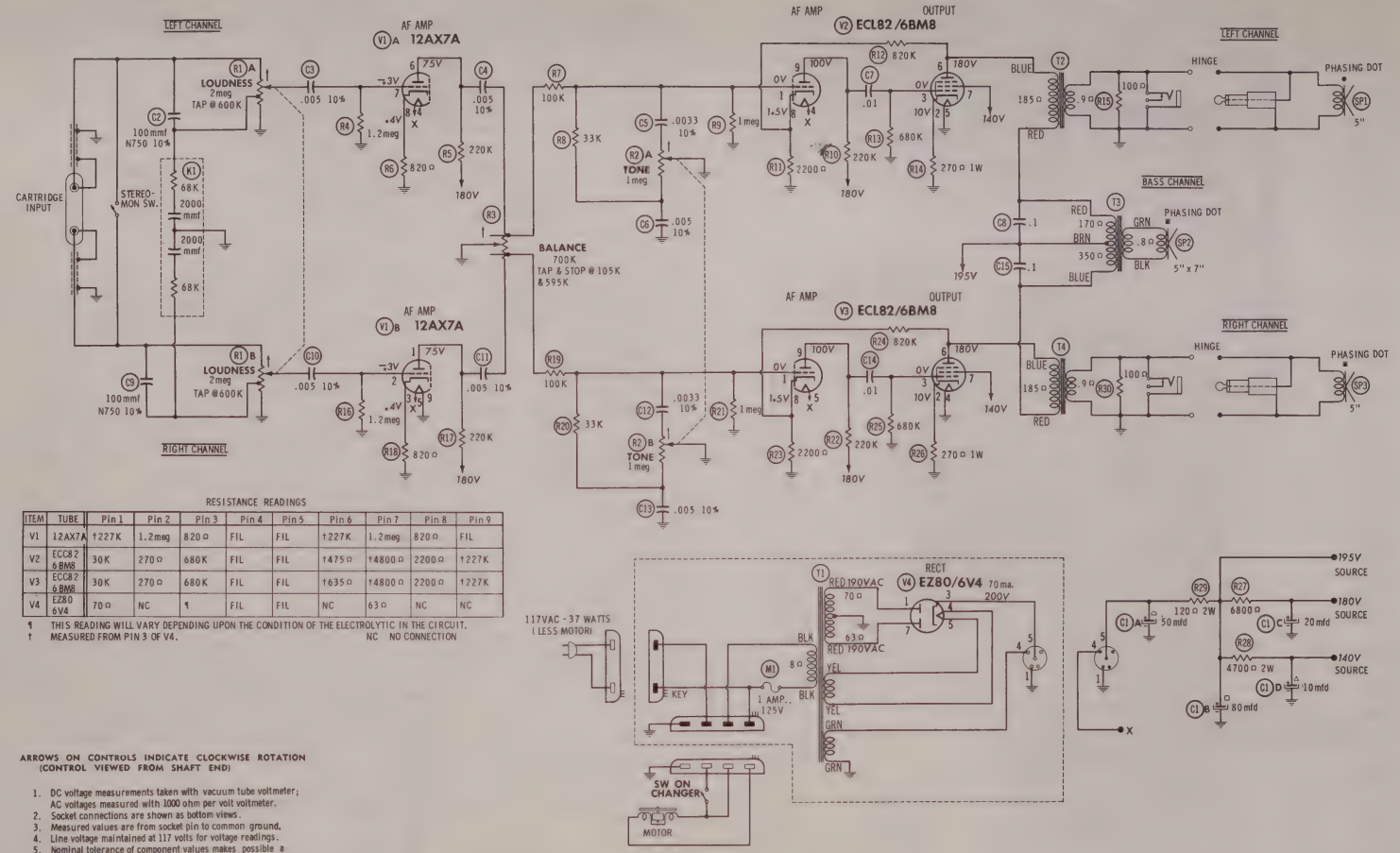
NAME	PART NO.	DESCRIPTION
Knob	36K647035	Loudness, Tone
Knob	36K647034	Balance
Cabinet	16E60415A01	Blue, Model SH19B
Cabinet	16E60415A02	Gold, Model SH19GL
Base	15K647070	Charcoal, Model SH19B
Base	15E646984	Brown, Model SH19GL

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



POWER CHASSIS



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7A	†227K	1.2meg	820Ω	FIL	FIL	†227K	1.2meg	820Ω	FIL
V2	ECC82 6BM8	30K	270Ω	680K	FIL	FIL	†475Ω	†4800Ω	2200Ω	†227K
V3	ECC82 6BM8	30K	270Ω	680K	FIL	FIL	†635Ω	†4800Ω	2200Ω	†227K
V4	EZ80 6V4	70Ω	NC	¶	FIL	FIL	NC	63Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V4. NC NO CONNECTION

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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MOTOROLA MODELS SH19B, SH19GL (Ch. HS-861, HS-869)

PHOTOFACT® Folder with CIRCUITRACE®

SILVERTONE MODELS 1044, 1045, 1046 (Ch. 528.54080)

SILVERTONE MODELS 1044, 1045, 1046 (Ch. 528.54080)

MODEL 1044

SILVERTONE MODELS 1044, 1045, 1046 (Ch. 528.54080)

TRADE NAME	Silvertone Models 1044, 1045, 1046 (Ch. 528.54080)		
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois		
TYPE SET	Battery Operated Transistorized Portable AM Receiver With Clock		
POWER SUPPLY	4.5 Volts DC (Radio), 1.5 Volts DC (Clock)	RATING	14MA @ 4.5 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540 – 1600KC		20MA @ 4.5 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A5...GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A4, A6.....GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to base of Converter. Low side to chassis.	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	Loop	1610KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	532KC	Tuning gang fully closed.	"	A5	"
4.	"	1400KC	1400KC Signal.	"	A6	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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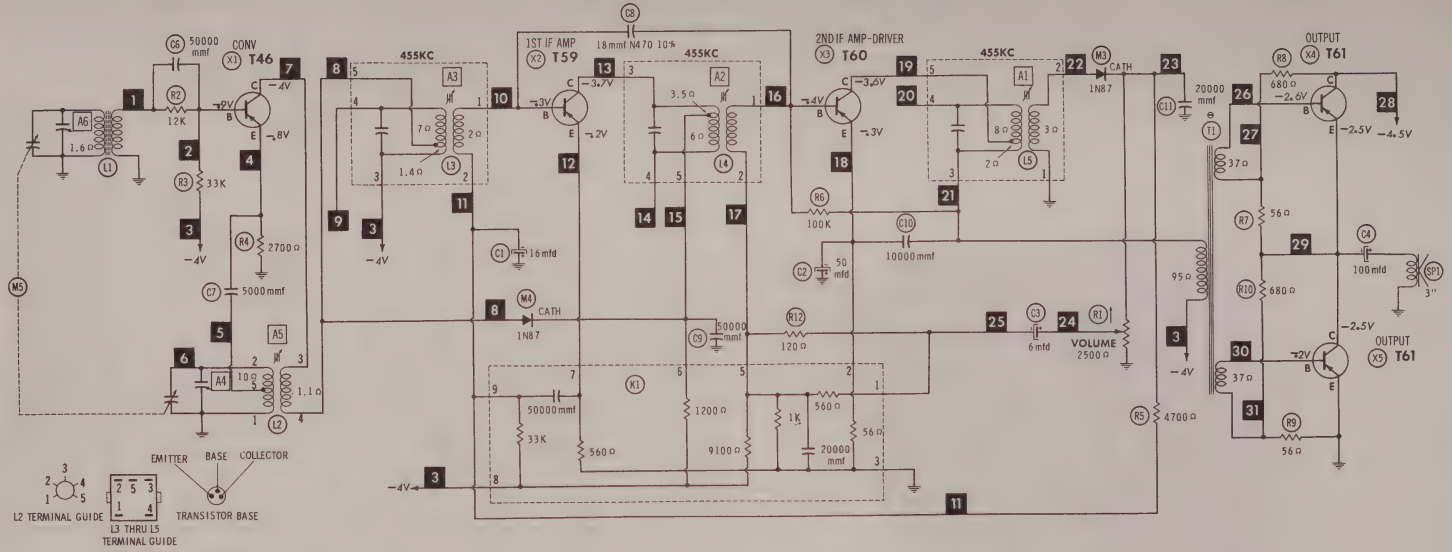


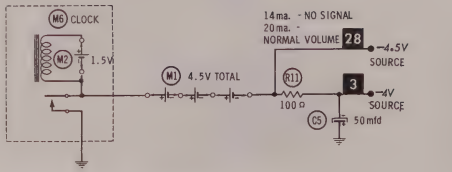
RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)



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SILVERTONE MODELS 1044, 1045, 1046 (Ch. 528.54080)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	T46	Converter		2N486		PNP
X2	T59	1st IF Amplifier				PNP
X3	T60	2nd IF Amp. -Driver				PNP
X4	T61	Output				PNP
	T45 *	Output				PNP — Matched
X5	T61	Output				PNP — Pair
	T45 *	Output				PNP

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	16	3	18-95-5	PTT7	NLW15-12	TT6X15	MLV15-3	TE-1053.5	
C2	50	3	18-100-5	PTT12	NLW50-3	TT6X50	MLV50-3	TE-1058	
C3	6	15	18-84-5	PTT6S	NLW6-15	TT25X6	MLV5-15	TE-1153	
C4	100	15	18-99-5	PTT73	NLW100-15	TT15X100	MLV100-15	TE-1162	
C5	50	12	18-94-5	PTT59	NLW50-15	TT15X50	MLV50-12	TE-1133	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	50000		BPD-05	DD-503	H-05S5	IDP-2-503	GP150	5HK-S50
C7	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C8	18 N470 10%	#15-18013				*		
C9	50000		BPD-05	DD-503	H-05S5	IDP-2-503	GP150	5HK-S50
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C11	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

\# Silvertone Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2500Ω	½	24-385-0	B-702		Q13-111	RU252A	Volume
B	Bushing			Not Req.		Not Req.	SL-38	
C	Shaft			Not Req.		Not Req.	SL-3500	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	12K				R8	680Ω			
R3	33K				R9	56Ω			
R4	2700Ω				R10	680Ω			
R5	4700Ω				R11	100Ω			
R6	100K				R12	120Ω			
R7	56Ω								

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	IF-Audio Network	20000mmf, 50000mmf, 56Ω, 560Ω, 560Ω, 1000Ω, 1200Ω, 9100Ω, 33K	13-43-3	

PRINTED BOARD

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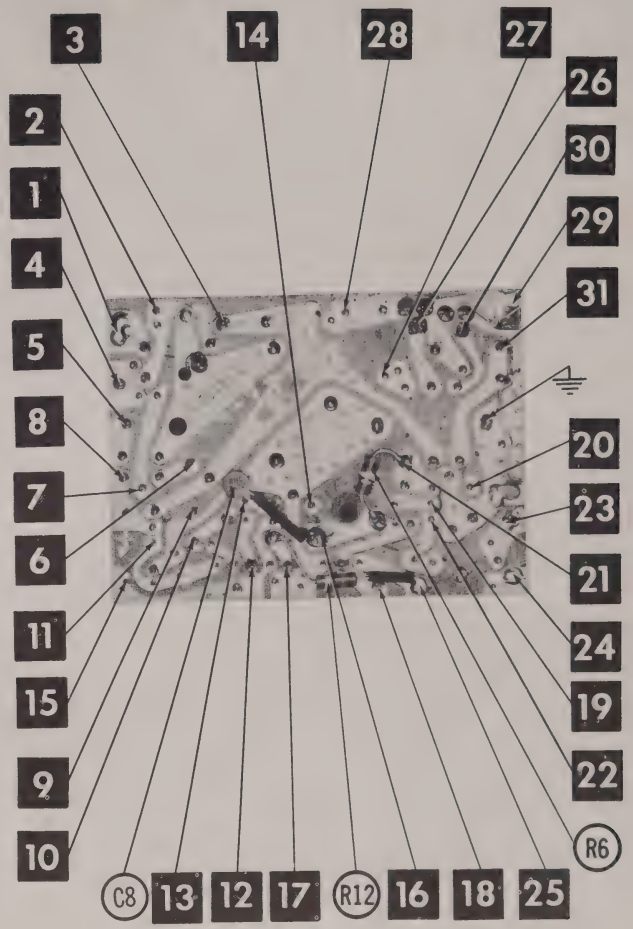


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		SILVERTONE PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick	82-171-0					
L2	Osc.	10-67-4					
L3	1st IF	10-139-2					
L4	2nd IF	10-140-2					
L5	3rd IF	10-141-2					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SILVERTONE PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.7	1 SEC. 2 1	80-100-ID ①					① Alternate Part #80-100-1

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	3"	PM	30-40Ω	33-424-4		

BATTERIES

ITEM No.	VOLTAGE	SILVERTONE PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	6446		130		635		M-14R	3 Required (Radio)
M2	1.5V	6446		130		635		M-14R	1 Required (Clock)

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		SILVERTONE PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	1N87	CTP-461		1N87	1N87	Detector (Pigtail)
M4	1N87	CTP-461		1N87	1N87	AVC (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M5	Tuning Cap	19-82-2	2 Gang
M6	Clock	59-169	Complete
	Printed Board	84-11341-0	Assembly Complete, Includes Transistors
	Printed Board	25-19-1	Assembly, Less Transistors

CABINETS & CABINET PARTS

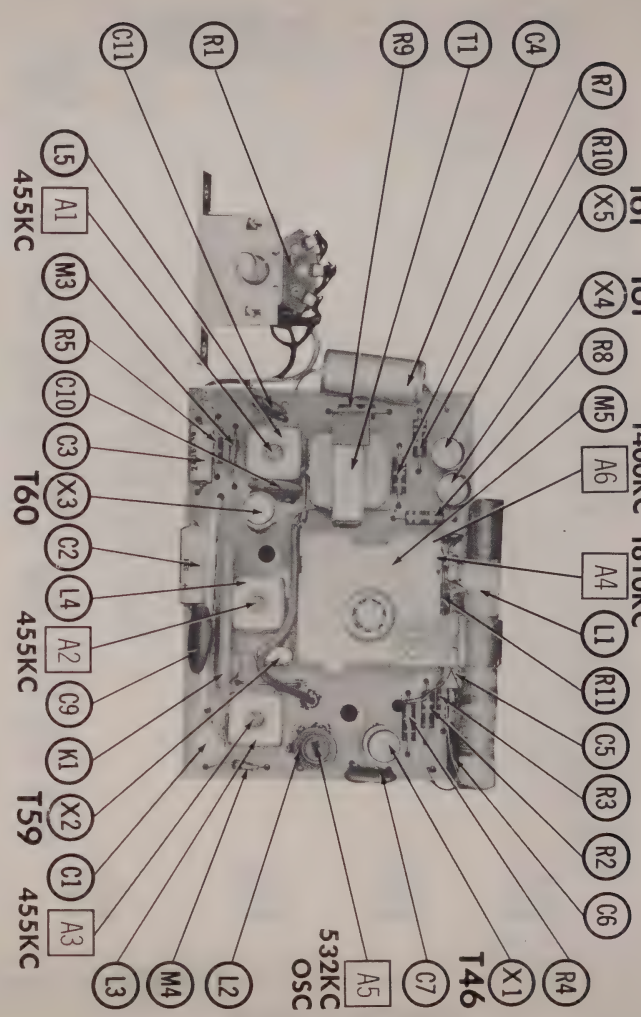
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Window	67-675-0	
Knob	52-1354-0	Tuning
Knob	52-1355-0	Volume
Knob	52-1353-0	Clock
Cabinet Back	42-123-1	Model 1044
Cabinet Back	42-124-1	Model 1045
Cabinet Back	42-131-1	Model 1046
Cabinet Front	42-121-1	Model 1044
Cabinet Front	42-122-1	Model 1045
Cabinet Front	42-130-1	Model 1046
Handle	49-595	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



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SYLVANIA MODELS 6P08B, T, 6P09T, W (Ch. 666-1, 666-2)

SYLVANIA MODELS 6P08B, T, 6P09T, W (Ch. 666-1, 666-2)

MODEL 6P09T

SYLVANIA MODELS 6P08B, T, 6P09T, W (Ch. 666-1, 666-2)

TRADE NAME	Sylvania Models 6P08B, 6P08T (Ch. 666-1); 6P09T, 6P09W (Ch. 666-2) Codes C00, C01, C02
MANUFACTURER	Sylvania Home Electronics, Div. of Sylvania Electric Products, Inc., 700 Ellicott Street, Batavia, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	4 Volts DC RATING 15MA @ 4 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540 — 1600KC 20MA @ 4 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3.... GENERAL CEMENT #8607, 9291, 9294
WALSCO #2520, 2522, 2523, 2524, 2534, 2537
A4.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A5, A6.....GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	600KC	600KC	"	A4	Adjust for maximum output while rocking tuning gang.
3.	"	1650KC	Tuning gang fully open.	"	A5	Adjust for maximum output.
4.	"	1450KC	1450KC Signal.	"	A6	"

SET 546 FOLDER 16

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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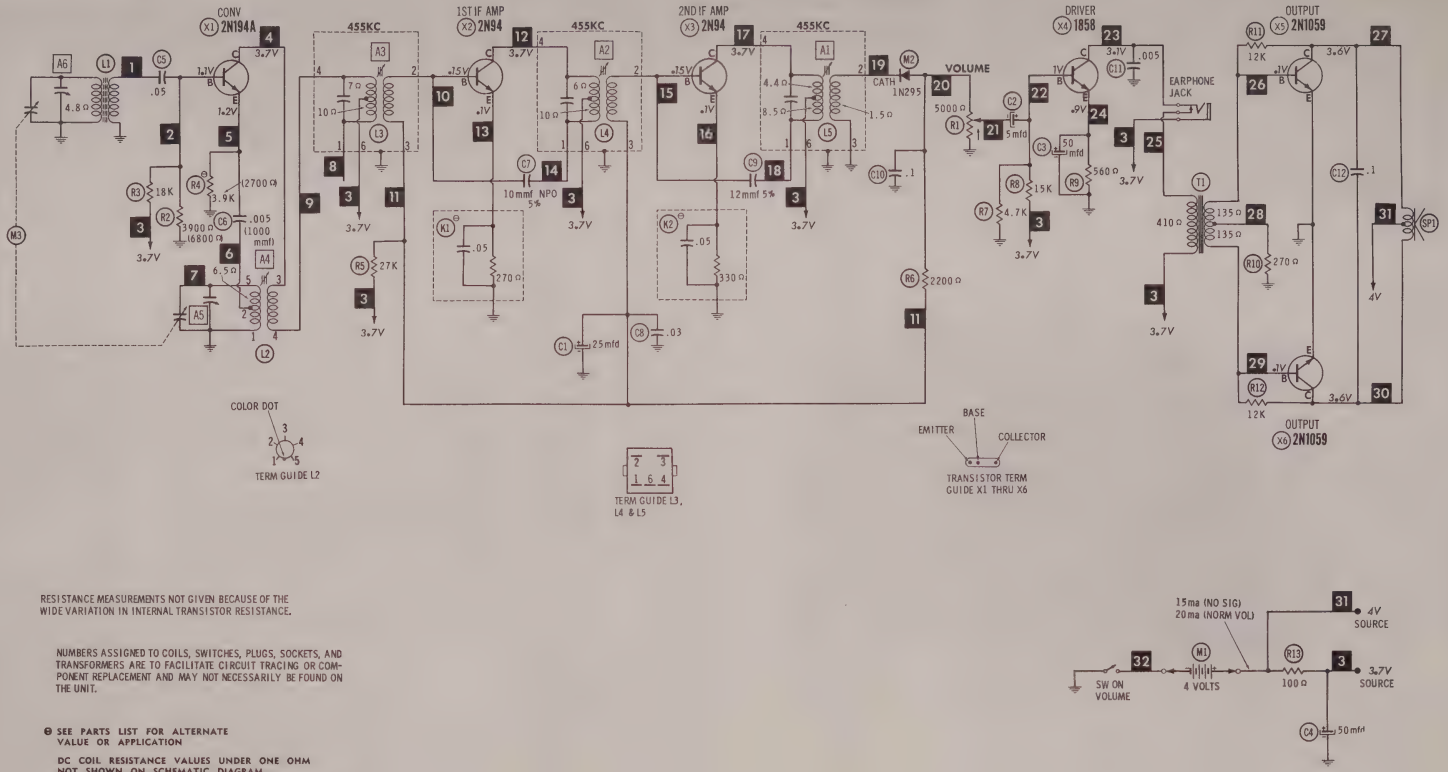

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

❸ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE™

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SYLVANIA MODELS 6P08B, T, 6P09T, W (Ch. 666-1, 666-2)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N194A	Converter		2N1366	2N194	NPN
X2	2N94	1st IF Amplifier	2N410	2N1367	2N94	NPN
X3	2N94	2nd IF Amplifier	2N410	2N1367	2N94	NPN
X4	1858	Driver	2N649			NPN
X5	2N1059	Output	2N649		2N1059	NPN
X6	2N1059	Output	2N649		2N1059	NPN

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	25	10	161-1072	PTT42	NLW25-10	TT10X25	MLV25-10	TE-1118	
C2	5	3	161-1074	PTT4	NLW5-15	TT6X5	MLV5-3	TE-1052.2	
C3	50	10	161-1073	PTT45	NLW50-10	TT10X50	MLV50-10	TE-1119	
C4	50	10	161-1075	PTT45	NLW50-10	TT10X50	MLV50-10	TE-1119	

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.05		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C6	.005	(1000) †	C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C7	10 NPO 5%		NPO-DI 10	DTZ-10	C10QIC	CCTO-100	CNO-410	10TCC-Q10
C8	.03	#189-0122						TG-S30
C9	12 NPO 5%			TCZ-12	C10QI2U	CCTO-120	CNO-412	10TCC-Q12
C10	.1		C80V104AM	UK10-104	H-05P1		TA-010	TG-P10
C11	.005		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C12	.1		C80V104AM	UK10-104	H-05P1		TA-010	TG-P10

† Alternate Value.
# Sylvania Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4	157-0064					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R2	3900Ω			(6800Ω) †
R3	18K			
R4	3900Ω			(2700Ω) *
R5	27K			
R6	2200Ω			
R7	4700Ω			

ITEM No.	RATING	REPLACEMENT DATA		REMARKS
		IRC PART No.	WORKMAN TV PART No.	
R8	15K			
R9	560Ω			
R10	270Ω			
R11	12K			
R12	12K			
R13	100Ω			

† Alternate Value.
* Used in Code 02.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYLVANIA PART No.	REPLACEMENT DATA
K1	1st IF Emitter Bias	.05mfd, 270Ω (Code 01) .05mfd, 270Ω (Code 00)	190-0065 190-0065	
K2	2nd IF Emitter Bias	.05mfd, 330Ω (Code 01) .05mfd, 270Ω (Code 00)	190-0066 190-0065	

PRINTED BOARD

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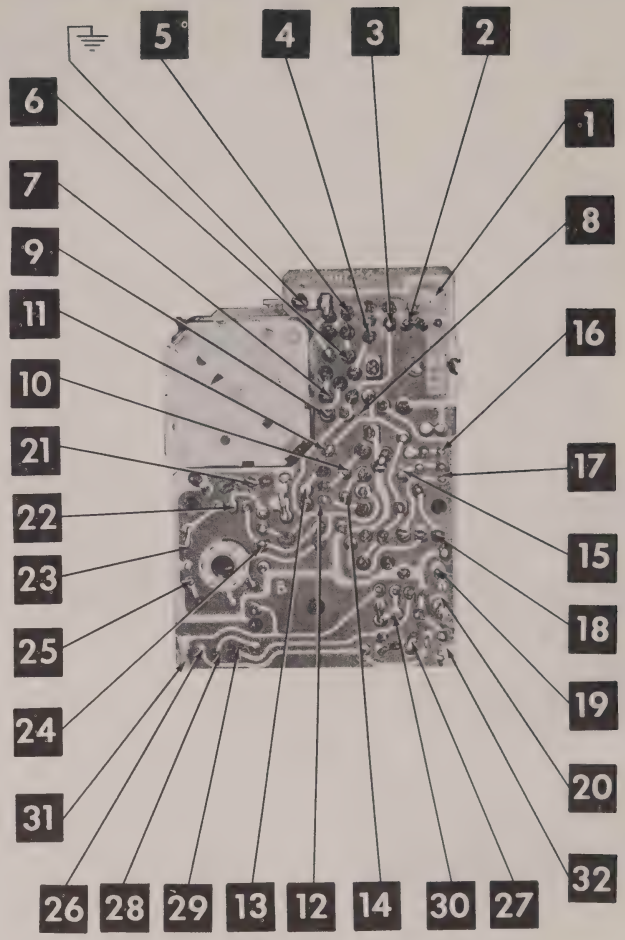


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		SYLVANIA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick	581-0030					
L2	Osc.	113-0087					
L3	1st IF	121-0117					
L4	2nd IF	121-0117					
L5	3rd IF	122-0043					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	SYLVANIA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1, 3	1	143-0103					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	
SP1	2"	PM	90-110Ω	539-2002		

BATTERIES

ITEM No.	VOLTAGE	SYLVANIA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	4V			H133 *		333 †		MN-1306†	* Mercury † Carbon

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		SYLVANIA PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N295			1N295	1N295	Detector

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3	Tuning Cap. Printed Board	170-0056 (32-98029-1)	

CABINETS & CABINET PARTS

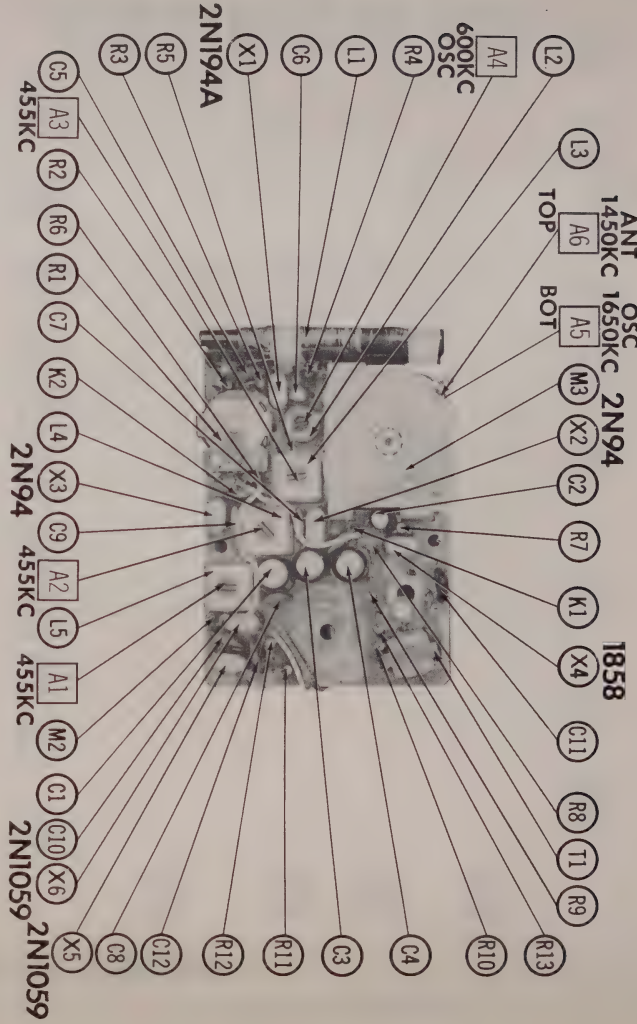
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	741-0106	Tuning, Models 6P08B, 6P08T
Knob	741-0107	Tuning, Models 6P09T, 6P09W
Knob	740-0418	Volume
Cabinet Back	822-0146	Model 6P08B
Cabinet Back	822-0142	Model 6P08T
Cabinet Back	822-0148	Model 6P09T
Cabinet Back	822-0147	Model 6P09W
Cabinet Front	822-0143	Model 6P08B
Cabinet Front	822-0141	Model 6P08T
Cabinet Front	822-0145	Model 6P09T
Cabinet Front	822-0144	Model 6P09W

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



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TOSHIBA MODEL
5TP-90

TOSHIBA MODEL
5TP-90

TOSHIBA MODEL
5TP-90

TRADE NAME	Toshiba Model 5TP-90
IMPORTER	Transistor World Corp., 52 Broadway, New York 4, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC RATING 6MA @ 9 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540-1600KC 10MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A4... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A3, A5..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A3	"
3.	"	600KC	600KC	"	A4	"
4.	"	1400KC	1400KC Signal.	"	A5	Adjust for maximum output. Repeat Steps 2, 3 and 4.

SET 546 FOLDER 17

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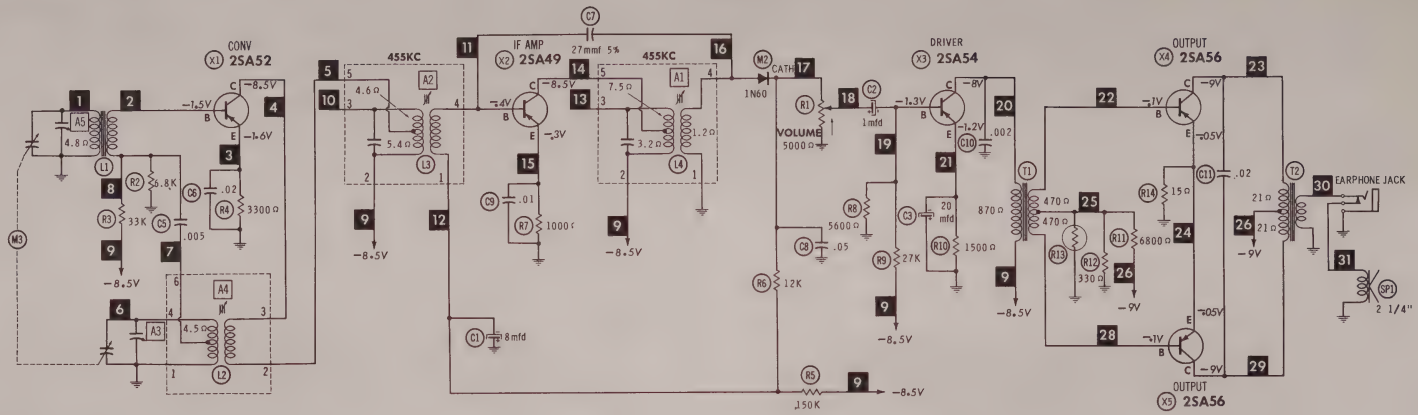

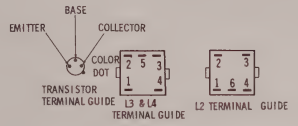

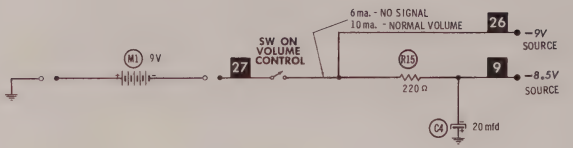

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

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TOSHIBA MODEL 5TP-90

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2SA52	Converter				PNP
X2	2SA49	IF Amplifier				PNP
X3	2SB54	Driver	2N406			PNP
X4	2SB56	Output	2N408			PNP
X5	2SB56	Output	2N408			PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	TOSHIBA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	8	3			NLW8-10	TT6X8	MLV10-3	TE-1052.5	
C2	1	10			NLW1-50	TT12X1	MLV2-12	TE-1120	
C3	20	3			NLW20-6	TT3X25	MLV20-12	TE-1054	
C4	20	10		BCD12020	NLW20-15	TT15X20	MLV20-12	TE-1130	

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.005		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50
C6	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C7	27 5%		1469-000027	TCZ-27	22R5Q27	CM-19B-270J	CNO-427	MS-427
C8	.05		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C9	.01		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C10	.002		D1-2000	DM-202	BYA10D2	CCD-202	B-220	5HK-D20
C11	.02		C80V203AM	DA-203	H-05S2		TA-120	TG-S20

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TOSHIBA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4		B16-214				Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN TV PART No.	REMARKS			IRC PART No.	WORKMAN TV PART No.	REMARKS
R2	6800Ω				R9	27K			
R3	33K				R10	1500Ω			
R4	3300Ω				R11	6800Ω			
R5	150K				R12	330Ω			
R6	12K				R13	Temp. Comp.			
R7	1000Ω				R14	15Ω			
R8	5600Ω				R15	220Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		TOSHIBA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	
L1	Loopstick Oscillator						
L2	Input IF						
L3	Output IF						
L4							

PRINTED BOARD

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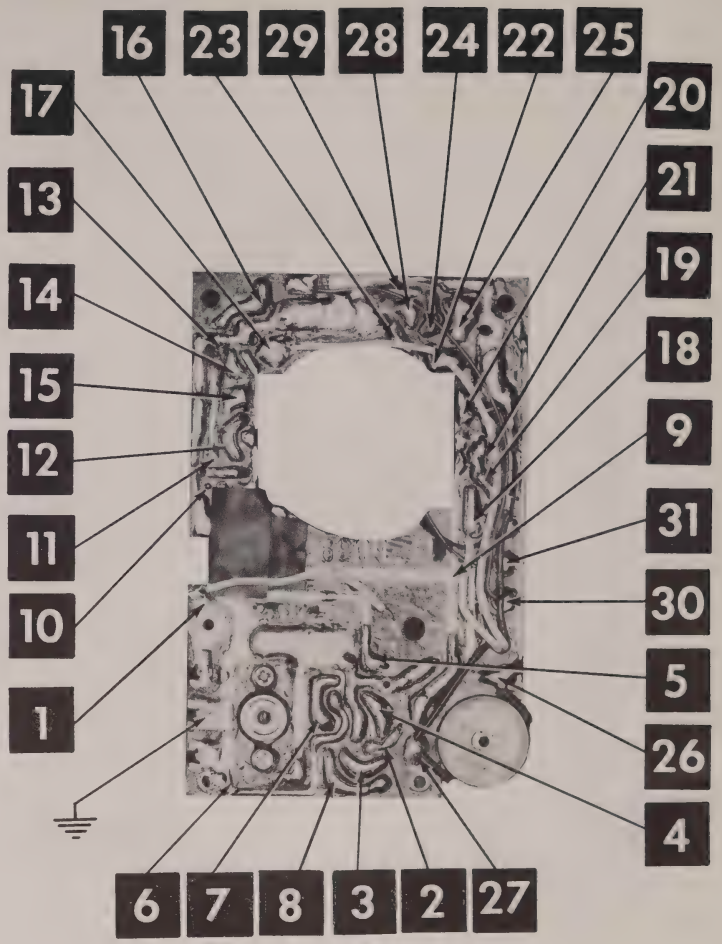


PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	TOSHIBA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.5	1	0497A					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	TOSHIBA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	600Ω CT	6-8Ω	0436A					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TOSHIBA PART No.	QUAM PART No.	
SP1	2 1/4"	PM	6-8Ω	2305A	22A06Z8	

BATTERIES

ITEM No.	VOLTAGE	TOSHIBA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	BL-006P		2U6		216		M-1604	

SIGNAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		TOSHIBA PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60			1N60	1N60	Detector (Pigtail)

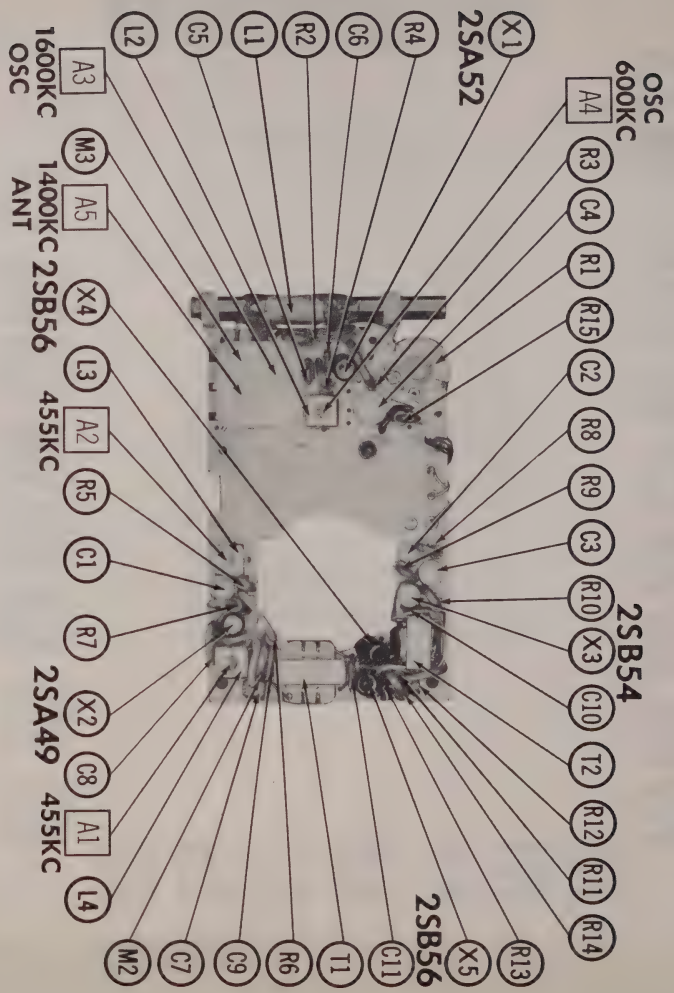
MISCELLANEOUS

ITEM No.	PART NAME	TOSHIBA PART No.	NOTES
M3	Tuning Cap.		2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder

V-M MODEL 309

V-M MODEL 309

V-M MODEL 309

TRADE NAME	V-M Model 309
MANUFACTURER	V-M Corp., 375 W. Main Street, Benton Harbor, Michigan
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110—120 Volts AC, 60 Cycles RATING 32 Watts, .35 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE V-M 1201 — PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12

DISASSEMBLY

When removing changer, press down and turn base plate counterclockwise.

SET 546 FOLDER 18

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1961 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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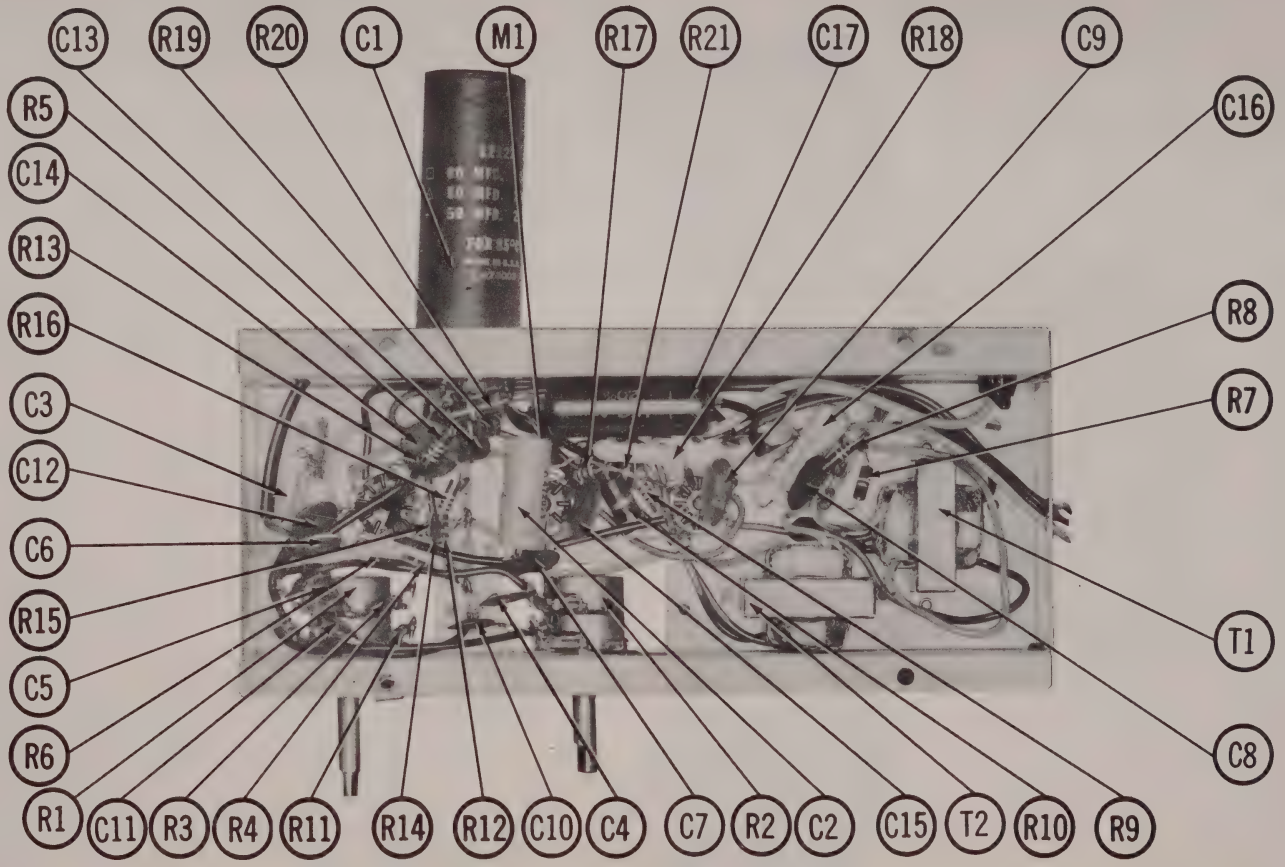
DATE 9—61 SET 546 FOLDER 18



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •)
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7 (7025) *

ITEM No.	USE	TYPE
V2	Left Channel Output	50EH5
V3	Right Channel Output	50EH5

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▪80	200	12122		XB0241	FP216.6	TMD-2200	TVL-2461	
B	▲50	200			BR8035	TC80	TD-80-350	TVA-1716	
C	50	200							
C2	10	25	12046	PRS1250	BBR10-25	TC22	TD-10-25	TVA-1204	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C4	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C5	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	22000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C8	22000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C10	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C11	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	22000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C14	22000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C15	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C16	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-503	GEM-4147	4TM-S47
C17	.1 600V		P688N-1	DF-104	CUB6D1	6DP-4-104	GEM-601	6TM-P10

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	12390					Volume, Right Channel
	200K Tap							
B	2meg	½						Volume, Left Channel
	200K Tap							
R2A	1meg	½	12391	B-70	AD47-1meg-Z		FA16A	Tone, Right Channel
B	1meg	½		SR-70	Not Req.		RU16A	Tone, Left Channel
C	Shaft			Not Req.	FS-3		CS3500	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	REPLACEMENT DATA WORKMAN TV PART No.	REMARKS
R3	100K			
R4	6.8meg			
R5	470K			
R6	560Ω			
R7	150K			
R8	68K			
R9	470K			
R10	33Ω 2W			
R11	100K			
R12	6.8meg			

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	REPLACEMENT DATA WORKMAN TV PART No.	REMARKS
R13	470K			
R14	560Ω			
R15	150K			
R16	68K			
R17	470K			
R18	22Ω			
R19	120Ω 2W			
R20	1500Ω 1W			
R21	33Ω 2W			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC. 1	REPLACEMENT DATA V-M PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	5000Ω	6-8Ω	12672					
		SEC. 2						
		15Ω						
		SEC. 1						
T2	5000Ω	6-8Ω	12672					
		SEC. 2						
		15Ω						

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA V-M PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	6-8Ω	24084-1 *	4A05Z8	* Alternate Part #24084
SP2	6"x 9"	PM	10-12Ω	24083-2 †	69A2Z12	† Alternate Part #24083
SP3	4"	PM	6-8Ω	24084-1 *	4A05Z8	

POWER RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA V-M PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.080A	12602	1N1763	2F4	SR200	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	V-M PART No. CARTRIDGE	V-M PART No. NEEDLE*	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE*	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE*	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE*	NOTES
M2	23960C	24043 * (LP)	17D	N8-7	26S	Not Req.	16T-S	Not Req.	
		24044 * (78 RPM)		N8-3					

MISCELLANEOUS

ITEM No.	PART NAME	V-M PART No.	NOTES
M3	Switch	21338	Power Off-On
M4	Motor	9134-B	
	Spindle	1105-2	45 RPM

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	24034-A	Volume (Inner)
Knob	24035-A	Volume (Outer)
Knob	24033-A	Tone
Cabinet	24745-LH	Speaker (Left)
Cabinet	24745-RH	Speaker (Right)
Cabinet	24192	
Handle	21877	White

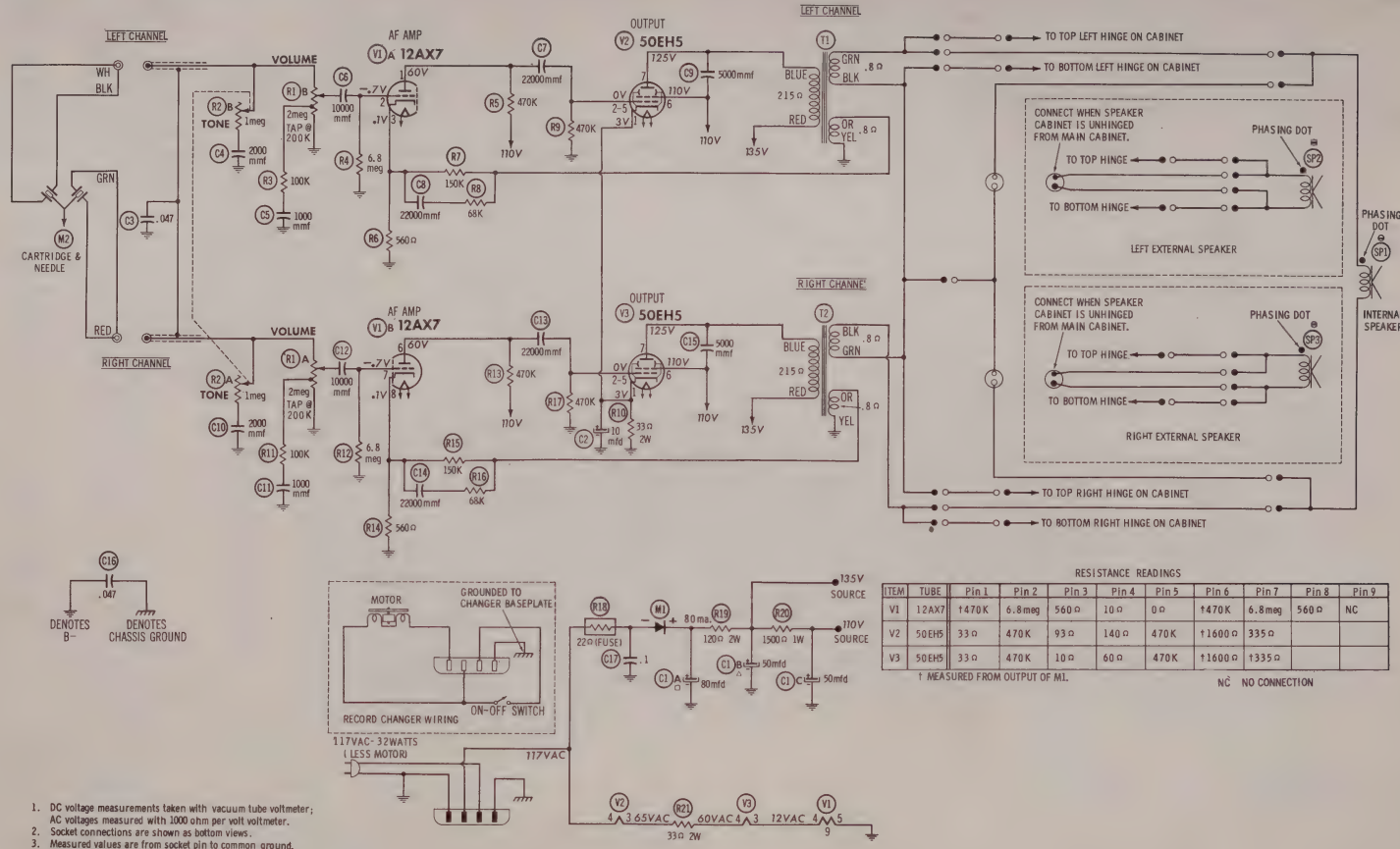
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†470K	6.8meg	560Ω	10Ω	0Ω	†470K	6.8meg	560Ω	NC
V2	50EH5	33Ω	470K	93Ω	140Ω	470K	†1600Ω	335Ω		
V3	50EH5	33Ω	470K	10Ω	60Ω	470K	†1600Ω	†335Ω		

† MEASURED FROM OUTPUT OF M1.

NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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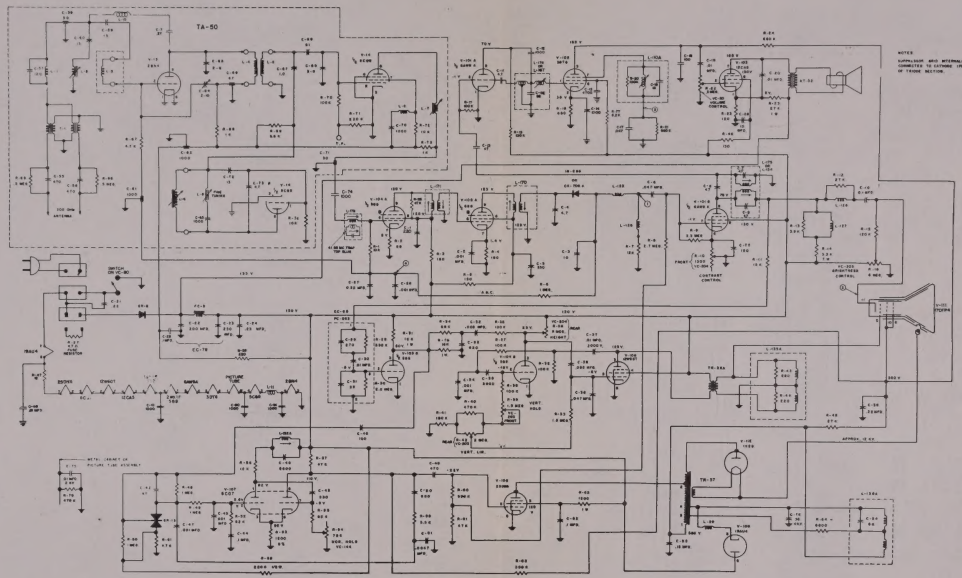
V-M MODEL 309



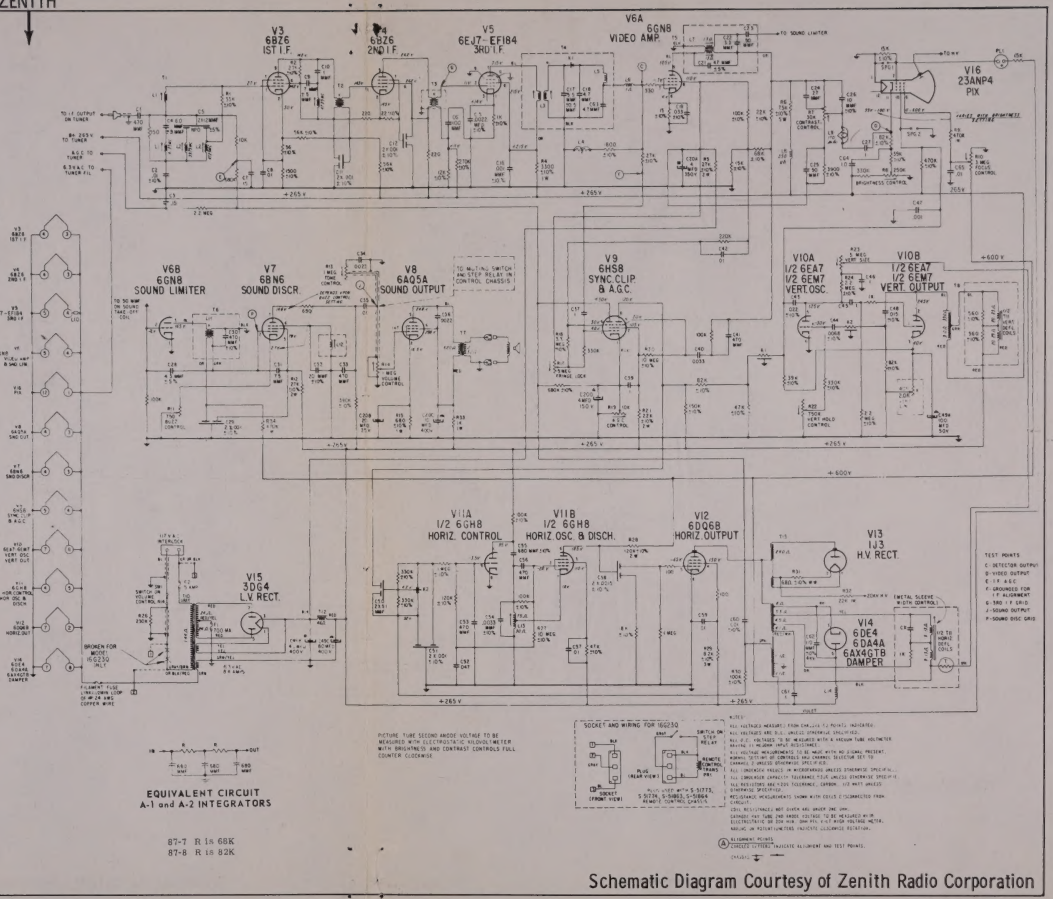
TRUETONE MODELS 2DC3220, 2DC3221

Schematic Diagram Courtesy of Western Auto Supply Company

← TRUETONE

ZENITH

ZENITH MODELS F2710YZ, YZU, F2712EZ, EZU, RZ, RZU, WZ, WZU, F2735E, EU, R, RU, W, WU, F2738E, EU, M, MU, R, RU, W, WU, F2739E, EU, W, WU, F2740E, EU, R, RU, W, WU, F2755H, HU, M, MU, R, RU, W, WU, F2756E, EU, R, RU, W, WU, F2786E, EU, R, RU, W, WU, F3342E, R, W, F3348R, W, F3350E, R, W, F3353W, F3354M, R, G2705R, RU, Y, YU, G2707R, RU, Y, YU, G2730E, EU, M, MU, R, RU, W, WU, G2735L, LU, R, RU, W, WU, G2737E, EU, R, RU, W, WU, G2738E, EU, M, MU, R, RU, W, WU, G2750H, HU, R, RU, W, WU, G2752R, RU, W, WU, Y, YU, G2780E, EU, R, RU, W, WU, G2786E, EU, M, MU, R, RU, W, WU, G2787W, WU, G3341E, M, R, W, G3341EZ, MZ, RZ, WZ, G3346E, EZ, M, MZ, R, RZ, W, WZ, G3348R, W, G3350E, R, W (CH. 16G23, Q, U)


V3 6BZ6 1ST I.F.
6BZ6 2ND I.F.
V5 6EJ7 EF184 3RD I.F.
V6A 6GN8 VIDEO AMP.
V16 25ANP4 PIX
V6B 6GN8 SOUND LIMITER
V7 6BN6 SOUND DISCR.
V8 6AQ5A SOUND OUTPUT
V9 6HS8 SYNC CLIP & A.G.C.
V10A 1/2 6EA7 1/2 6EM7 VERT. OSC.
V10B 1/2 6EA7 1/2 6EM7 VERT. OUTPUT
V11A 1/2 6GH8 HORIZ. CONTROL
V11B 1/2 6GH8 HORIZ. OSC. & DISCH.
V12 6DQ6B HORIZ. OUTPUT
V13 1A3 H.V. RECT.
V14 6DE4 6DA4A 6AX4GTB DAMPER
V15 3DG4 L.V. RECT.
EQUIVALENT CIRCUIT A-1 and A-2 INTEGRATORS
87-7 R is 68K
87-8 R is 82K
SOCKET AND WIRING FOR 16G23Q
TEST POINTS

Schematic Diagram Courtesy of Zenith Radio Corporation

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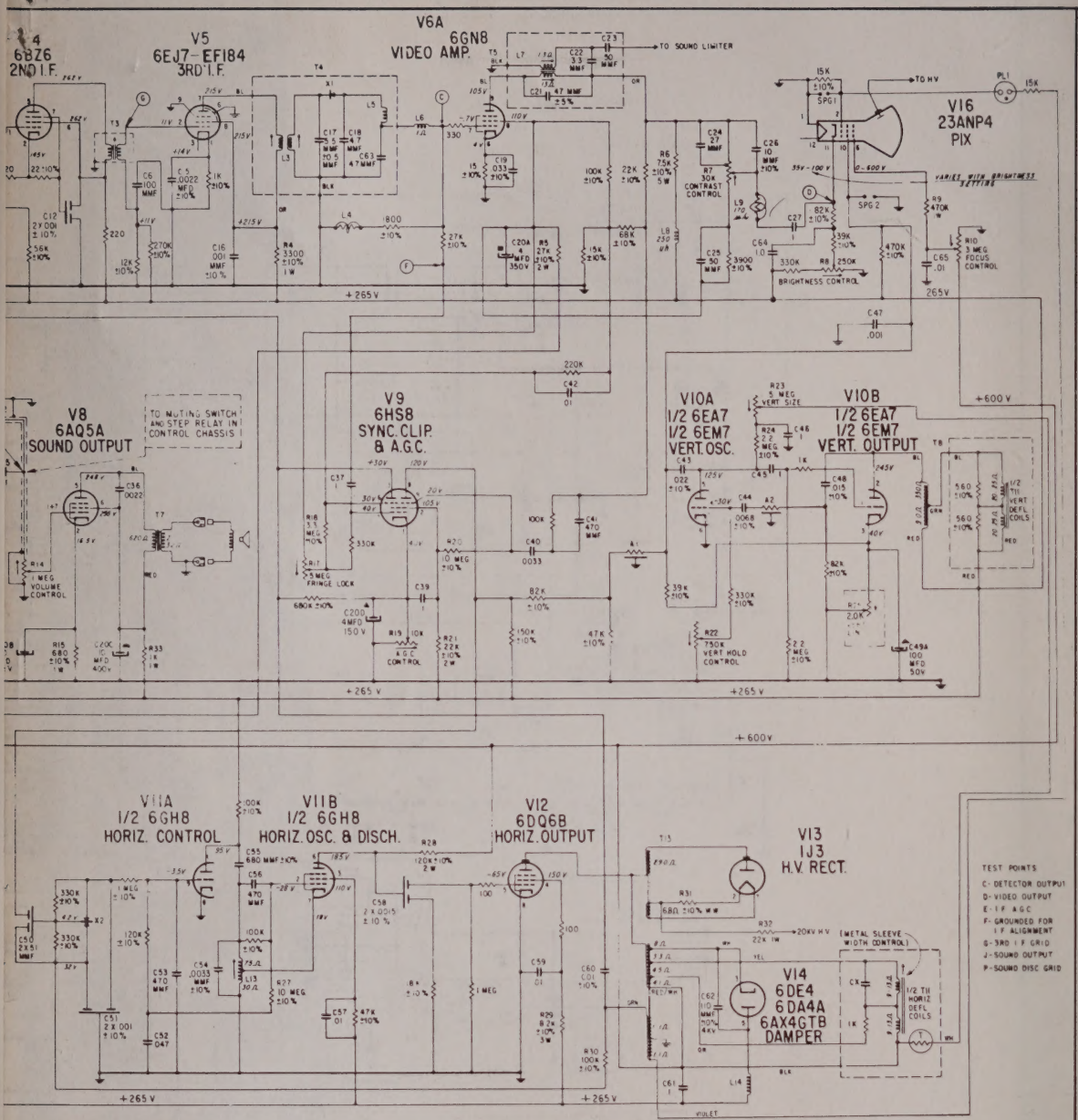
SET 546 FOLDER 19–S



Schematic Diagram Courtesy of Zenith Radio Corporation